IDSA Monograph Series
No. 25 September 2013

Climate Change Narratives: Reading the Arctic

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INSTITUTE FOR DEFENCE
STUDIES & ANALYSES

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ISBN: 978-93-82169-25-3

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First Published: September 2013

Price: Rs. /-

Published by: Institute for Defence Studies and Analyses
No.1, Development Enclave, Rao Tula Ram Marg,
Delhi Cantt., New Delhi - 110 010
Tel. (91-11) 2671-7983 Fax.(91-11) 2615 4191
E-mail: contactus@.idsa.in
Website: http://www.idsa.in

Cover & Layout by: Geeta Kumari

Printed at: M/S A. M. Offsetters
A-57, Sector-10, Noida-201 301 (U.P.)
Mob: 09810888667
E-mail: amoffsetters@gmail.com

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PREFACE

Climate has always changed, so what's the worry? The worry is that the change, both in terms of scale and linkages, is unprecedented. The politico-security narratives of Climate Change increasingly frame our understanding of other global challenges—from poverty and health to the food-energy-water connect.

This monograph is a consolidation of the thoughts and writings expressed by the author in the last few years on the various geo-physical impacts, as well as the geo-economic and geopolitical dimensions of Climate Change. It opens up the Arctic to these narratives, the aim being to understand the region as a new Climate Change front with new challenges and opportunities.

The author thanks Ashild Kolas, Research Professor at the Peace Research Institute, Oslo (PRIO) for having meticulously planned the field visits to the Barents Secretariat in Kirkenes in 2012; to the Fram Centre and the Arctic Council Secretariat in Tromso in 2013. Interaction with the Fridtjof Nansen Institute (FNI) and at the Ministry of Foreign Affairs in Olso have further helped the author in understanding the Arctic. The research visits have been part of the IDSA-PRIO cooperation.

The author appreciates IDSA for 'decentering security', and giving non-traditional security (if it still can be regarded as such) the attention and ascendency it deserves in today's security discourse.

Introduction: The Problem and The Objective

Climate change is now a mainstream political issue but lacks policy coherence and consistency, at both international and national levels. This is because the science of Climate Change is complex, and the politics to deal with it ever so complicated. Climate Change, therefore, will remain a huge challenge. Much of the discussion on the subject tends to be polarised, and starts with contesting the evidences of the potential impact. Disagreement is common in the negotiations towards a global climate deal, and gets regressive and protective on cuts in carbon emissions. On the specificity of funds for climate response, carbon trading and the potential for technological intervention, the discussion gets compartmentalised and inconclusive. The realisation for the need for mitigation and adaptation continues. In spite of the difficulty in reaching a consensus, the platform for debate, as seen in the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) meetings and the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol, has fortunately not collapsed. The debate is also coming around to an understanding that while a global agreement on Climate Change is important, it cannot be a subtitute to national action. Ultimately, it is at the national-level that real and effective responses to Climate Change have to be made.

The Climate Change debate and contestation has three main groups. The first are the 'sceptics' who challenge the dominant scientific body on the evidences to suggest that global warming are anthropogenic, that is., directly related to human activity. They also assert that climate has always changed and what is happening is not unusual. Another set of sceptics, while agreeing that Climate Change is happening, argue that the threats posed are exaggerated**.** They tend to place Climate Change as one of the challenges that nations have to deal with. The second group is the 'mainstream' thinking about Climate Change that takes its reference from the Intergoverenmental Panel on Climate

Change (IPCC) reports. The IPCC, with its capacity to bring together scientists and a large body of work with a review process, has been influential in creating a real understanding on the dangers of Climate Change. The third are the 'radicals', who believe that the world has already crossed the tipping point as is evident in the dramatic changes in the Arctic, and the ice-covers in Antarctica and Greenland.[1] Their policy suggestion is to adapt to the changes, and cope as best as possible by far-reaching actions rather than cosmetic ones.

Climate Change has moved swiftly to the centre-stage of public concern. There is a great deal of intense debate on the subject, and a wide-range of literature including numerous government response plans and documents. The IPCC as been quite influential in raising the awareness level and, with the high frequency of natural disasters with high impact, the public has become conscious of the destructive forces of nature and the human-induced reasons behind it.

The objective of this monograph's is to discuss the challenges of Climate Change in a specific security-geopolitical context, and how this translates in the Arctic. The monograph addresses the following narratives of Climate Change:

- As a security risk
- As a geostrategic orientation
- As an energy challenge

The goal is to consider the impact of Climate Change on the Arctic—which forms the second part of the monograph—and to assess the security and geo-strategic impact as well as an evaluation of the hydrocarbon find. The Arctic is indeed changing and rapidly. The changes have created an imagery of a bountiful region, with high political

[1] Anthony Giddens, *Politics of Climate Change*, Polity Press: London, 2009, p.14. Also see, http://www.fcampalans.cat/images/noticias/The_politics_of_climate_change_Anthony_Giddens(2).pdf

stakes and commercial gains. The great expectation, excitement, and accompanied nervousness is well expressed by Oran Young:

> It is hardly an exaggeration to say that the world is entering an age of the Arctic, an era in which those concerned with international peace and security will urgently need to know much more about the region and in which policymakers in the Arctic rim states will become increasingly concerned with Arctic affairs.[2]

In the mid-1980s, the ice-filled waters of the Arctic were primarily a strategic theatre, where the US and the Soviet Union (now Russia) were (and are) only 57 miles apart at the Bering Strait. Three decades hence, the world has truly entered an 'age of the Arctic'—but an Arctic that is increasingly ice-free during summer. This has brought on a new set of strategic significance, especially with potentially exploitable oil and gas resources. States would like to convert existing knowledge on the Arctic into political potential.

The Arctic region is a vast area around the North Pole, covering over 1/6th of the earth's landmass. This is roughly the size of Russia, China and India put together. Environmental, commercial and strategic forces are all set to play a critical role in the Arctic which, in turn, will impact world affairs. In the post-Cold War period, a move towards cooperative arrangements for managing the Arctic region led to the establishment of the Arctic Council in 1996. The Ottawa Declaration that established the Arctic Council was based on the idea of promoting cooperation, coordination, and interaction among the Arctic states, together with the indigenous communities in the region. The Council's members include the eight circumpolar countries: Norway, Sweden, Finland, Iceland, Denmark (Greenland and Faroe Islands), Canada, USA, and Russia. The organsiations that represent the indigenous peoples are also permanent participants in the Council. Also included in the Arctic Council are the non-littoral states which enjoy Observer Status. In May 2013, in their meeting in Kiruna (Sweden), the eight member states of the Arctic Council decided to grant Observer Status to six new countries:

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[2] Oran Young, 'The Age of Arctic', *Foreign Policy*, No.61, Winter 1985-1986, pp.160-179.

China, India, Italy, Japan, Singapore, and South Korea. The EU application as a single bloc was not accepted. There are now a total of 12 European and Asian states as Observers in the Council.[3]

With the permafrost melting faster than calculated, and the sea ice thinning to the point of disappearing in the summer, changes in the Arctic will affect not only the local people and the surrounding ecosystems but also the rest of the world, because the Arctic plays a special role in global climate. Implications are particularly great for future generations that will face the consequences of current action, or inaction. The Asian non-littoral countries are showing great interest in the Arctic, which has raised eye-brows on what the interests of such so called 'outsiders' could be, and the kind of role they could eventually play. Will it be disruptive? Or would it bring in larger participation, and more stability to the region?

The changes in the Arctic will present risks as well as opportunities. For example, the large reduction in summer sea"ice threatens the future of several ice-dependent species; but it will also increase marine access to resources. While scientists say the changes will be gradual, major dramatic surprises are also possible. Ocean currents in the North Atlantic might undergo major changes, with wide-ranging consequences for climate. The impact of the changing climate in the Arctic is already being widely observed and felt. The region is an early indicator of global climate health. The changes will also reach far beyond the Arctic in other ways as well, for example, by affecting sea levels, biodiversity and, as a consequence, also impact many aspects of the social and economic systems. Thus, climate change in the Arctic deserves and requires urgent attention by decision makers and the public worldwide.

Some broad observations are:

- Arctic climate is changing faster than predicted
- The consequences are not only local but global

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[3] Sara Reardon, 'China gains Observer Status', *New Scientist*, May 17, 2013. See http://www.newscientist.com/article/dn23553-china-gains-observer-status-on-the-arctic-council.html#.UeOVJjvI'zzg

- Reduced sea-ice will increase sea transport and access to resources
- Challenges and opportunities will come through competition for resources, as well as evolving a global mechanism for resource governance

Some specific observations as outlined by the Arctic Monitoring and Assessment Programme (AMAP) are:[4]

- In the past six years (2003-2010), the Arctic has witnessed the warmest period ever recorded. This is leading to changes in the cryosphere (the cryosphere comprises of snow, water, ice and the permafrost). Temperatures in the permafrost have risen up to 2 degree C. The southern limit of the permafrost has moved northward in Russia and Canada. The Arctic melt is man made.
- Two component of the Arctic cryosphere – snow and sea ice – are interacting with the climate system to accelerate warming. Only 15 per cent ice is 2 year old.
- Projections by the IPCC in 2007 underestimated the rates of change now observed. The IPCC Assessment Report 5 (AR5) will have a more thorough scientific assessment on the Arctic.
- Maximum snow depth is expected to increase over many areas by 2050, particularly in Siberia. Average snow cover duration is projected to decline by up to 20 per cent by 2050.
- Arctic Ocean is projected to become nearly ice-free in summer within this century, likely in the next 30-40 years.
- Changes in the cryosphere cause fundamental changes to the Arctic ecosystem which impact Arctic society on many levels resulting in challenges for local communities and traditional way of life.

[4] AMAP Executive Summary on Snow, Water, Ice and Permafrost (SWIP) in the Arctic, 2011, AMAP Secretariat, Oslo, 2011

- Changes in the distribution and occurrence of snow, ice and permafrost has led to transport options and access to resources.
- Changes in the Arctic are also a global concern having impacts on global climate including weather patterns and sea level. The loss of ice and snow increases the absorption of the sun's energy a the surface of the planet. The loss can increase methane and change large-scale ocean currents. The effect needs further study.
- The Arctic glacier, ice caps and the Greenland ice sheet contributed to 40 per cent of global sea rise between 2003 to 2008. The Arctic ice loss will significantly contribute to the sea level rise in the future, the projection being 0.9-1.6 m by 2100.
- The cryosphere changes will impact biodiversity and unique Arctic species as well as migratory mammals and birds.
- Some ways to deal with the urgency was discussed including global reduction in carbon emission, adaptation and mitigation measures, more monitoring and scientific studies and observations, stress on coordinated policies among the Arctic Council's member states, observer countries as well as permanent participants that include the indigenous organizations.

Based on the above scientific observations, and with the Observer Status of Asian countries, some key security and geo-strategic questions emerge. A few of these questions are considered in this monograph, and include those regarding the changing political and security balance in the Arctic. How will Norway and Russia, key littoral Arctic states, reconfigure the leap of Asian countries towards the Arctic? Will the exclusivity of the Arctic Council be redefined by the surge in applications for Observers' Status by Asian countries? What key governance issues will emerge in the Arctic region? And, how will the UN Convention on the Law of the Sea and the International maritime Organisation (IMO) be looked at with the greater participation of the countries in the Arctic.

All these tantalising questions would not have appeared in the first place had the impact of Climate Change on the Arctic not been demonstrable. For Asian countries, the Arctic would have remained a

distant and unrelated place, charming because of its icy remoteness and a destination for occasional expedition. The impact of Climate Change on the Arctic has opened up a new front with new challenges and opportunities.

Climate Change Narratives

Climate Change as a Security Risk

As an overarching issue, Climate Change impacts global peace and security. While Climate Change is a phenomena happening gradually, the life sustaining resources of the planet are being consumed at a rapid rate, and thus leaving it in a fragile state. A third of the world's arable soil has been eroded, and productivity per acre falling sharply. The demand for food is growing exponentially, and fresh water availability is fast declining. Estimates indicate that 75 per cent of the world's major fisheries are over exploited, and it is calculated that global fisheries risk complete collapse by 2050. These are existential, life-dependent issues, with long-term and often irreversible consequences. The picture is truly worrisome, and one can see why in these circumstances even the modest impacts of Climate Change can be described as a threat multiplier for instability, and presents significant security challenges for countries. In its 2007 report, the IPCC summarized the effects of Climate Change by kind, likelihood, and impact on different sectors, such as agriculture and human health, indicating that 'some weather events and extremes will become more frequent, more widespread, and/or more intense during the 21st century'.[5] In 2012, the world witnessed more natural disasters than ever before.

In an interconnected world with interlinked issues, understanding Climate Change and security, and exploring the intersection between the two, is extremely valuable. Warning and risks are no doubt important

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5 IPCC, Climate Change 2007: Synthesis Report. See, http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf

in shaping the response mechanism; but while that may be so, the question that needs to be determined is whether to have a broader climate policy, or to have specific responses to security threats. Connections between Climate Change and national security merit concern in their own right, and because some significant Climate Change is inevitable, links between Climate Change and national security need to be sharpened, and specific policies required to address security consequences.

Climate and Security: How and Where

In understanding Climate Change, and its impact on security, it is important to separate the 'how' question—that is, how will Climate Change lead to conflict, and how has it come to part of the mainstream of security?—from the 'where' question—that is, where will such conflicts occur? Discourses on security have long been contested: sometimes being viewed as 'tantamount to emancipation', and sometimes as 'power' and 'order'. There are also those who take an altogether different position, contending strongly that true security 'can only be achieved by people and group if they do not deprive others of it'. The discourse on security underwent a profound change in the 1990s: from being primarily state-centric to becoming a 'reinvention of security other than military'.[6] In the initial years, the 'broadening' of the security ambit was contested by its critics who felt it would destroy '…its intellectual coherence and make it more difficult to devise solutions to any of these important problems'.[7] The proponents, however, reasoned security through its multiple meanings. The 'deepening' debate of security (security to the level of individuals) emphasises on the safety of societies, groups and individuals, in contrast to the more traditional approach to security studies that focus on protecting states from external threats. There is now a growing understanding that people's security

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[6] Barry Buzan, Ole Waever, and Jaap de Wilde, *Security: A New Framework for Analysis* London: Lynne Riener Publishers, 1988, p. 210.

[7] Stephen M. Walt (1991) contends that any attempt to widen the discourse on security is always resisted. See, 'The Renaissance of Security Studies', *International Studies Quarterly*, Vol. 35, p. 212.

around the world is 'interlinked', and that conflict and deprivation are 'interconnected'. Should then Climate Change be framed as a security issue? What is implied when we securitize Climate Change? Who is the securitizing actor? What is the referent object? In any given analysis, this matrix position is to be identified.

Drawing from the securitization theory of Barry Buzan and Ole Waever, it can be argued that there is a normative dilemma to formulate responses to Climate Change in the language of security. Many would view 'securitizing' Climate Change as essentially bolstering initiatives by raising awareness, and of the management of resources. In this securitization framework, the *securitizing actor* is the state, whose role is to raise Climate Change to an exceptional level of politics, one which justifies extraordinary political action, even armed approach. Climate Change, according to this model, is identified as threatened, but only in the sense that the threat to Climate Change implies a threat to the state. This presumed threat to the state enables extraordinary power to be invoked. The alleged *threat* is, thus, complex, comprising political choices and action, regulatory mechanism, economic factors, malevolent actors such as terrorists, in addition to the naturally occurring threats of scarcity and disasters/calamities. However, the danger to this is that the language of security pushes responses away from 'developmental strategies' towards 'military and intelligence organizations'. The securitization framework, moreover, brings into play a 'threat-defense' logic that stresses narrow national interest, and undermines broad cooperative mechanism. It is a complex dilemma.

Yet, it is argued in various quarters that a successful securitization of Climate Change, for example, could result in vital safety for low lying islands, and, therefore the need to activate such initiatives that reverses the impact of Climate Change. Such a scenario bolsters the argument in favor of presenting Climate Change as a security issue. The tool of the securitization theory allows us to discern the ultimate referent of state-oriented geopolitics, and to differentiate it from the human securitization of Climate Change. The latter analysis sees the individual as the ultimate link in the chain of securitization. In the geopolitical framework, Climate Change is pointed out as the initial referent object. But the threat to Climate Change is defined not as the link to state security, but to the livelihood of the individual. The politically, socially,

economically, and culturally situated individual is the end-referent of this analysis.

In the Cold War period, Climate Change issues found little or no space in the security matrix. The security framework was built by maintaining the capability to defeat or deter aggression. Military strength was the key, and Climate Change issues were peripheral. With the disintegration of the Soviet Union and the end of the Cold War, Climate Change as a concept in a post-Cold War of peace dividends, institution building, and new approaches to resolving conflict got considerable attention. Since Climate Change problems cut across borders, and are common to countries near and far, the dominant Cold War security themes of 'territoriality' and 'impermeability' held little ground. Owing to the transnational nature of Climate Change, active reconciliation rather than mutual recrimination gained currency. Climate Change, by its very nature, challenged the Cold War notion of security based on unilateral solutions, and the advocacy of military actions. With the demise of the Cold War, and the growing scientific evidence of the impact of Climate Change, there was a systemic attempt to redefine security. Broadening the definition of security to include 'newer' and more non-traditional threats that can undermine political stability, undercut economic productivity, or erode levels of human well being was considered.

In understanding Climate Change and security, it is important to consider that the impacts of Climate Change affects not only conflicts as diverse as war, terrorism or diplomatic and trade disputes, but also conflict within states. Two points need to be noted:

- There is no single causal factor to environment-induced conflict. It varies from case to case. In some it may be a major factor, in others it may be a minor one.
- Environment-induced conflict is not an entity in itself but part of the complex pathways to conflict that involves political, strategic, economic and territorial factors.

Climate Change makes a compelling case to think about security in terms of redefining it. In many ways, it challenges state-centric proprietorship of security. First, as stated, the traditional security framework is antithetical to Climate Change issues for the simple reason that the impact does not respect state borders and, therefore, limits

states from taking unilateral action. Second, in traditional security understanding, the protection of territorial integrity is primarily based on the threat from an enemy, or the 'other'. In the case of Climate Change, the threat comes from the imbalances in the ecosystems that are human-induced. Third, in the traditional security approach, the participation of the actors and their contribution to enhancing the understanding of security is limited and elitist, whereas mapping Climate Change threats and seeking remedies to prevent it requires broad-based participation and an interdisciplinary approach. A greater participation of the epistemic community (a transnational network of scientists, social sciences experts, and NGOs) and their involvement in the national and international decision-making process is needed.

However, there has been marked resistance from both the traditional security community as well as the environmental community to link security to Climate Change. The traditional security community argues that Climate Change issues are primarily welfare and development concerns, and that the state has always been oriented towards protecting the environment. The environmental community feels that positioning environmental issues into the security ambit only reinforces the state-centric apparatus.

The debate also revolves on the approach to Climate Change threats: whether it should be co-opted into the 'state-centric security framework' or whether the approach should be one of 'securing the environment' in which the environment is both the security referent and security goal. It is reasoned, through the latter approach, that it is better to focus separately on the components of Climate Change—carbon emission reduction and food-energy-water security. The 'securing the environment' approach suggests trade-offs. For example, cutting down on arms expenditure for aforestation programmes, soil conservation, and energy efficiency. Viewing Climate Change impact from the point of view of the 'state-centric security framework' has its pitfalls. For example, climate security can become an instrument for developed countries to impose their values on developing countries, and infringe upon their sovereignty—a tool of hegemonic power. Moreover, climate security rhetoric encourages thinking that could lead nations to undertake military intervention in the name of protecting 'global' resources.

Resource scarcity, particularly of non-renewable resources, will be a critical challenge to national security. Conflicts generated by resource scarcity can have significant indirect effects on the international community. For example, sub-national violence over resource access can lead to serious repercussions for the security interests of both the developed and developing worlds. Civil violence within states can affect external trade relations, cause refugee flows, and produce humanitarian disasters that call upon the military and financial resources of developed countries and international organizations. Scarcities of renewable resources rarely cause wars among states; but the impact of Climate Change on river waters in particular, can change the historical assessment on transboundary waters, and thus reframe riparian relations. Given the Climate Change stress on river waters both in terms of quantity and quality, states will try to maximize water resources, and in a certain geopolitical context, convert it into assets to augment their power. Down stream countries highly dependent on river waters for their well being will be motivated to seize such vital resource from their neighbours to the point of even being aggressive. Climate Change impact on water resources shows that conflict and turmoil related to river will be as much internal as it will affect bilateral relations. Water management and the reallocation of water resources will be a major national security concern.

While the key issue in dealing with the aspect of security is the recognition that Climate Change is truly global in character, it is equally important to understand local characteristics and the varying impact on ecological areas. Information and findings are critical to understanding Climate Change and national security. The lack of complete information does not mean that the problem is not grave. The challenge is to fashion a careful and effective response, along with proper research and findings.

Another issue that defines national security response to Climate Change is the time factor. Climate Change is not a trigger event. It is a gradual phenomenon which can potentially change the conditions of conflict, and which may either be a 'threat multiplier' or even a 'threat reducer'. For defence and security planners, this is essential. For example, the snow melt in the Tibetan plateau will not help China; but, in terms of military logistics, it will be of considerable advantage to India. Such indications point to the fact that Climate Change should not be viewed

as a threat in the classical sense, but as a 'mover and shaker' of conflicts. It is in the uncertainty of Climate Change, both in time framework and evidence, that the threat emerges. The impact of Climate Change has not been witnessed except in small measure. The dire consequences are in the future timeframe of 50 and 100 years. Yet, and in spite of the above argument, one needs to consider national security from the 'down-side risks'. For example, the Antarctic or the Greenland ice melt will have catastrophic consequences. From the 'up-side risks', if Climate Change does not turn out to be calamitous given the fact of its uncertainty, then policies and actions on Climate Change can easily be readjusted and reversed. It is, thus, critical to give higher weightage and due consideration to the downside risks.

An important feature of national security today is to look at climate impacts from a socio-development perspective. Keeping humans at the centre of the Climate Change debate is essential in formulating the right adaptation and mitigation policies. Here, sustainable development becomes the key to conserve resource spaces because Climate Change will directly impact such vital spaces. Any sustainable growth has to be in juxtaposition with population growth. Population pressure on scarce resources may lead to social stress that sometime erupts in violence. Population growth also encourages the overexploitation of resources. It has a spiraling effect. Interwined with population growth is poverty. Poverty forces people to overwork on croplands, clear forests, and cultivate arid lands and fragile mountain slopes beyond the threshold of reversible environmental degradation. Poverty and population growth reinforce each other in terms of their negative environmental consequences. As population grows, so too will economic activities, and so also will the consumption of fossil fuels. Rapid population growth and increasing emissions are two distinct characteristics of the modern age. Population has grown sevenfold since 1800, and carbon emissions have increased 150 times.[8]

[8] John Seager, 'Links between climate change and population growth', Global Post, November 28, 2012, 07:46 http://www.globalpost.com/dispatches/globalpost-blogs/commentary/links-climate-change-population-growth. Accessed on January 12, 2013

Summing-up

Large-scale human-induced environmental pressures have the propensity to seriously affect national and international security. Unfortunately, the climate change-security theme encompasses an almost unmanageable array of sub-issues, especially when 'security' is defined broadly to include human, physical, social, and economic wellbeing. For a comprehensive national security policy, the adaptation and mitigation strategies of the impact of Climate Change should be viewed as complements rather than competing alternatives. Some policies will be targeted at adaptation, most notably risk-reduction and preparedness policies at home and abroad. Such an approach will reduce any military mobilization to rescue people, and to prevent regional disorder. Other policies related to climate change will focus on mitigation, which is now becoming universally accepted as an essential part of the response to Climate Change. Mitigation efforts will require being global in their reach, and involving the world's major economies, such as those of China and India. National security will be linked with the concerns of other states, and there is a strong possibility of the convergence of common threats that will help to craft strategies against climate change.

One cannot, however, rule out the possibility of competing interests—in which Climate Change presents an opportunity to advance states' interest—as well.

Climate Change-Security Risk in the Arctic: Initial Readings

There is now a heightened urgency in the Arctic. The combined effect of warming, sovereignty, territorial and security issues bring in a host of challenges and potential dangers. The biggest of them is to prevent an arms race in the Arctic. Despite the countries within the Arctic Circle espousing co-operative policies and joint practices, most of the countries have also stated that they will guard and protect their interests, and are proceeding to build up their military capability. The tensions will only magnify as non-littoral states like China increase their footprint in the region.

The potential international and domestic security implications of an ice-free Arctic in the summer are being discussed amongst the Arctic

littoral states as well as the non-littoral countries. For example, the Office of Science and Technology Policy within the White House is frantically collating information through the Interagency Arctic Research Policy Committee (IARPC).[9] This agency, charged with coordinating federal research on the Arctic, is chaired by the National Science Foundation, and includes among its members NASA, the US Department of Homeland Security, and the Pentagon.[10] With the Arctic situation snowballing, and evidence now pointing to an ice-free Arctic in the summer of 2015, the situation has been described as a 'runaway train'.[11]

The first of the security concerns relates to the 'vicious circle'. As Climate Change impacts the Arctic, the 'tipping elements' in the Arctic ecosystem further impact the earth system, leading to abrupt changes. With the geo-physical changes in the Arctic, we are now in the era of dangerous Climate Change and extreme weather. NASA satellite imagery in March 2013 has revealed massive cracks in the ice connecting Beaufort Gyre region to Alaska.[12] Scientists have also been describing the phenomena called the 'Arctic amplification' in which the loss of sea-ice and warming are altering ocean currents and weather patterns. The accelerating Arctic ice melt is now influencing heat waves, affecting water resources, and undermining harvests and food production. These are critical life-sustaining resources which, when disturbed, can have a destabilizing impact on society.

The security linkages will get stronger as the changes in the Arctic result in increased demand for defense support to civil authorities for humanitarian assistance and disaster response. Equally, the military will have to assess and adjust to the physical changes on its facilities, infrastructure, and its training and testing activities. The primary goals will be for the militaries to be better prepared, and a thrust towards

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9 See, *The Guardian* (London), May 2, 2013. http://www.guardian.co.uk/environment/earth-insight/2013/may/02/white-house-arctic-ice-death-spiral.

10 Ibid.

11 Ibid.

12 See NASA Satellite Imagery, http://www.sierraclub.ca/en/blog/paul-beckwith/bad-news-arctic-icecap-cracking. Accessed on June 12, 2013

cooperative partnerships with the Arctic stakeholders to address the challenges and opportunities in the Arctic region.

The Arctic 'stakeholders', including the USA, Russia, Canada, Norway and Denmark, are keen to exploit the northern polar region's untapped natural wealth. Estimated to hold a quarter of the world's remaining undiscovered oil and gas reserves, the region might prompt these countries to expand their military presence, thus opening up the area to militarization and arms build-up. Many predict a 'New Great Game' among the five Arctic coastal states.[13] The US Homeland Security department's Climate Change Roadmap, released in 2012, has clearly spelt out that, on the Arctic, it is imperative for the US to protect resource interests by increasing regional military penetration. The report says:

> Melting sea ice in the Arctic may lead to new opportunities for shipping, tourism, and resource exploration, but the increase in human activity may require a significant increase in operational capabilities in the region in order to safeguard lawful trade and travel and to prevent exploitation of new routes for smuggling and trafficking.[14]

Climate Change as a Geopolitical Orientation

As mentioned earlier, there is the science of Climate Change, and there is also the politics of climate. Then, there are the inescapable economic choices and intertwined security concerns. A combination of these very critical aspects reflect the predicament of states in coming to terms with Climate Change. This also points to group interests and lobbies, and the 'voice' of the marginalized community represented through civil socities that take differing positions. This section of the monograph will observe how the issues of climate are playing into existing geopolitical conditions.

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13 'Hands across the Melting Ice', *International Herald Tribune*, May 14, 2013

14 Climate Change Adaptation Roadmap, Department of Homeland Security, June 2012. See, http://www.dhs.gov/sites/default/files/publications/Appendix%20A%20DHS%20FY2012%20Climate%20Change%20Adaptation%20Plan_0.pdf. P.10

The fundamental argument of geopolitical theory is actually an argument of stability. Curiously, problems in international politics are usually not solved; they are just overtaken by other problems. Based on this tenet, Climate Change has to be understood as having effects 'in combination' with other major global issues, and ascertaining whether 'such interaction' is impacting the international order. When global trends are factored in, there is a broad consensus that Climate Change can act as a 'stress multiplier' on states and societies. The nature of consequences will vary according to sociopolitical indices. This can be further formulated through state''society dynamics: whether there are deep fractures in society and whether there is latent or actual internal strife; the type of regime—democratic or authoritarian; and the kind of relations a country has with its neighbours.

Climate Change issues challenge states to reach out beyond their narrow defined interests; to introspect and redefine their priorities. However, states often misrepresent the social reality associated with Climate Change. The ensuing asymmetries in risk perceptions are likely to complicate adaptation and mitigation efforts. Climate Change can, therefore, affect global and regional dynamics. But, to what level it is a 'threat', and whether it would lead to 'violent conflict' is hard to determine, as the causal factors remain difficult to ascertain. Based on various spatial-temporal assessments and analysis, in the short-to-medium term, Climate Change is unlikely to lead to an increase in conflicts. In the long-term, unmitigated Climate Change could have consequences for international security.[15]

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[15] Climate Scenario 1: Expected Climate Change. By 2040, average global temperature rises to 1.3 c above the 1990 average. Climate Scenario 2: Severe Climate Change. Average global surface temperature rises at an unexpectedly rapid rate to 2.6 c above 1990 levels by 2040. Climate Scenario 3: Catastrophic Climate Change. Between 2040 and 2100, the impact associated with Climate Change becomes large-scale. The average global temperatures rise to 5.6 c above 1990 levels.

The 3 scenarios are based on the Centre for Strategic and International Studies (CSIS) Report, 'Age of Consequences: The Foreign Policy and National Security Implications of Global Climate Change', November 2007. See, http://csis.org/files/media/csis/pubs/071105_ageofconsequences.pdf

Another approach to the climate change-induced social conflict analysis is the problem-solving 'reformist' tradition that searches for solutions through managerial and technological know-how. Critics of this approach underline a crucial fact—that Climate Change is not merely about a mismatch between the impact of human activities and the environment's capacity to sustain them or simply about technical 'fixation'; it is, and more importantly, about the interlinkages between social and economic issues, equity and justice and, above all, political interest. An extension of this argument is the postmodernist approach that 'aims to give voice to the poor, oppressed, and otherwise disadvantaged in an attempt to limit hegemonic tendencies of the powerful.'[16]

Findings of several research works have come to an understanding that natural resources and Climate Change issues can exacerbate conflicts. What crystalises from the Climate Change arguments and approaches explained above is: first, that the developing countries will be more vulnerable to environmental change than the developed countries; second, as the human population grows, particularly in the developing countries, the state's capacity vis-à-vis the damages from serious social disruption will be constantly challenged.

This section tries to understand how Climate Change is bringing forth a new set of political equations. The earlier section examined Climate Change as a threat to peace and security. The interface of Climate Change and geopolitics can be determined and understood through tradeoffs, bargaining and negotiating positions, and of realignment of forces.

The UN Debate

The implications of Climate Change on security have been extensively debated in the UN Security Council. The most notable one was in

[16] Paul Wapner, 'The Sovereignty of Nature? Environmental Protection in a Postmodern Age', *International Studies Quarterly*, Vol. 46, 2002, p.167

April 2007 featuring more than 50 representatives.[17] A number of states raised concerns by bringing the issue of Climate Change to the Security Council forum, and treating it as a security issue. The UK Foreign Secretary, Margaret Beckett, who held the presidency of the Council for the month of April, initiated the debate. She raised the point that Climate Change was a security issue, but was not a matter of 'narrow national security' but 'our collective security in a fragile and increasingly interdependent world'.[18] Her argument stressed that Climate Change is grave enough to be regarded as a threat to international security and, therefore, the Security Council as the so-called 'executive body' of the UN should play a lead role in solving the impending crisis. Beckett's argument, however, was understood as an unnecessary aggrandizement of the Security Council, ready to assume, yet again, the role of a guarantor and saviour of the world, and narrow the responses through the powers and responsibilities of the permanent members of the council, and characteristically undermine the authority of other bodies like the General Assembly and the Economic and Social Council.

The Security Council debate reflects, to a great extent, the polarization of the views on Climate Change. The line of divide is structured around the articulation by developing countries of their socio-economic development, and for a more widely representative and effective General Assembly. Among the P5 members, China argued against the Council taking up Climate Change and was supported by Pakistan who, speaking on behalf of the Group of 77 developing countries, stressed the role of the Economic and Social Council and the General Assembly, and the 'ever-increasing encroachment of the Security Council' as a 'distortion' of the principles and purposes of the UN

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17 For details of the Security Council Debate on Climate Change see, http://www.un.org/News/Press/docs/2007/sc9000.doc.htm. Accessed on December 12, 2012

18 Ibid.

Charter.[19] The Pakistan''China understanding and palpable coziness is an important alignment on issues relating to the UN—whether it is restructuring the UN role or on the expansion of the Security Council. The two seem to be one. First, China and Pakistan have skillfully 'diluted' and 'downgraded' the Security Council vis-à-vis Climate Change and, simultaneously, shifted the focus away from the expansion of the permanent position in the Council, almost 'demotivating' it. It also, from the point of view of geopolitics, selectively marginalizes India's quest for a permanent position by effectively enhancing bodies like the General Assembly (GA) and The United Nations Economic and Social Council (ECOSOC). Here is a good case of how the issue of Climate Change brings interested partners as 'collaborators' and 'blockers' in the game of power position and strategic rivalry.

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[19] France, the UK, and the USA are on the same wave length, while China and Russia take a different position. Some of the statements of the P5 are as follows: **The Russian Federation** appealed to the international community to avoid panic, and to consider the issue of Climate Change in all its aspects in a comprehensive manner and within the appropriate international forums, such as the World Meteorological Organization, the General Assembly, and the Commission on Sustainable Development, among others. The Security Council should only deal with issues directly under its mandate. **The UK** took the position that Climate Change was transforming the way the international community thought about security, and that those impacts went beyond the environment to the very heart of the security agenda. **France** backed UK's proposition, and considers Climate Change among the main threats to the future of humankind and its possible impact on international peace and security. The Security Council was certainly not the mainand the only forum—to address the issue, but could not ignore the threats to peace and security caused by Climate Change. The **USA** emphasized that energy, security, Climate Change, and sustainable development were fundamentally linked, and that Climate Change threats were real and would affect security among nations. Everyone had a role to play. **Maldives**, recalled that, some 20 years ago, his country's President had said that, for his country, a mean sea-level rise of 2 metres would suffice to virtually submerge the entire country of 1,190 small islands. That would be the death of a nation. Almost 20 years from that General Assembly address, it was important to recall the efforts made by small countries like the Maldives to draw the world's attention to the urgency of Climate Change and its consequences. For the people of the Maldives, dealing with Climate Change was already an everyday fact of life. Over the past two decades, the country has seen, first hand, the real, practical reality of Climate Change and sea-level rise. Today, over 60 per cent of its inhabited islands are facing varying degrees of coastal erosion, which is threatening the human settlements on them. See, Security Council Debate on Climate Change, at http://www.un.org/News/Press/docs/2007sc9000.doc.htm. Also see Security Council Open Debate on Maintainence of International Peace and Security: The Impact of Climate Change, July 20, 2011

In July 2011, the German Federal Foreign Office made a call to bring the security implications of Climate Change to the attention of the United Nations Security Council (UNSC). A debate was initiated within the Security Council on July 20, 2011. The debate was seen as a wider recognition of the links between climate and security and, importantly, to develop political strategies. The key messages that came out of the debate was that Climate Change is increasingly challenging the international community, and that much of the efforts in the past have been weak. By focussing on some of the implications like sea level rise, food security and migration—the Security Council called for collective future actions. The main objectives were to raise the profile of Climate Change as a top priority, and not as an issue for the future and, more importantly, to frame Climate Change within the foriegn policy agenda.[20] During the debate, the UN Secretary General said, 'The facts are clear: climate change is real and accelerating in a dangerous manner. It not only exacerbates threats to international peace and security; it is a threat to international peace and security.'[21]

From being apprehensive and uncomfortable in linking Climate Change to security in the UNSC debate in 2007 to a growing acceptance in the 2011 open debate, states are increasingly realising the importance of diplomacy in building and deeping international alliances, and the future of sustainable development.

Brics and Blocks

In the geopolitical setting, four loosely structured blocks of states have emerged with a mix of concerns and actions on Climate Change. These include,

1. The Alliance of Small Island States (AOSIS): these groups of island are in constant fear of rising sea levels and large submergence of their coastal line. Articulating their concerns and

[20] 'Climate Diplomacy: Reducing Risks for Security', Report by Adelphi and German Federal Foreign Office, Berlin 2012, p. 7

[21] Ibid., p.13

pushing strongly for ecological effectiveness is critical for these states. They also need strong supporting partners to build an effective international constituency. The EU is the closest to supporting the AOSIS, and in the Climate Change groupings both of them have come together as one voice pushing for 'ecological effectiveness'.[22]

2. The Organization of the Petroleum Exporting Countries (OPEC) and various industrialized countries form another cluster of interests and concerns. Being fossil-driven economies, the members of this group have reasons to be inward and protectionist. The group is essentially structured around economic ramifications that climate change will bring forth and the fear of an international regime putting stringent conditions on carbon emissions. This group is seeking a way forward by intensifying research and development into creating carbon 'sinks' to soak up carbon dioxide emissions, and thereby protect the fossil-based industry. Such groups are seeking 'economic effectiveness'.[23]

3. Many of the developing countries are converging together on the principled position of the right to develop, the right to utilize resources, and not be penalized. It is the quintessential North-South debate based on a strong developing world advocacy that they are owed an incalculable ecological, social and economic debt by the industrialised developed countries. The ecological debt also includes the illegitimate appropriation of the atmosphere and the planet's absorption capacity by the industrialised countries. They are therefore seeking 'social justice and equity'.[24]

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[22] The Centre for Science and Environment (CSE) divides the Climate Change debate as 'Ecological effectiveness', 'Economic effectiveness', and 'Social justice and equity'.

[23] Ibid

[24] Ibid.

It is clear that, through these groupings, interests and influences are in constant interface with Climate Change. As the political profile of Climate Change gets stronger, the impact of politics will intensify. Responses are invariably going to create fissures, with developing countries finding themselves in a difficult position most of time. Commercial interests driven by carbon markets have the potential to create societal wedges. Such arguments are built up as a countervailing force in the political economy of Climate Change which has less to do with trade liberalization than resonance and power.[25] In the two decades or so of international understanding on Climate Change, one has seen the primacy of 'economic effectiveness' and, therefore, the dominance of industrialized countries in the negotiation process. However, as trends indicate, this will not necessarily determine the future course of action on Climate Change.

The shifts in economic power are fast translating into political and military power. A significant expression of such changes is the G5 (Brazil, China, India, Mexico and South Africa), which came out with an important political declaration on the sidelines of the G8 Summit in Japan.[26] This non-western-non-industrialised group, widely described as the 'rise of the rest', potentially challenges the economic dominance of the West, at times beating it and changing the rules along the way. The G5 can break away and regroup with other states. BRICS (Brazil, Russia, India, China and South Africa) is another example. Even IBSA (India, Brazil and South Africa) can become an important forum, and redefine its role based on carbon emissions and developmental strategies. With power quite diffused, and the emergence of many competing states, the possibility of such groupings can become an important counterweight to the negotiation process on Climate Change. In spite of differing values that can pull them apart, such groups will be drawn by Climate Change interests that will push them into relationships, and even political partnerships.

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[25] Nick Mabey, *Delivering Climate Security*, Whitehall Paper 69, RUSI, London: Routledge, 2007, p. 94

[26] For details of the Declaration, see IDSA *Strategic Digest*, August 2008.

The rules of the games are already changing in the Climate Change negotiation process. There has emerged a certain hyphenated India-China position on Climate Change (this monograph will later on argue for a dehyphenated relationship between the two countries), particularly on the right to development and desecuritising Climate Change. With such strategic shifts and consequent reconfigurations of the international order, Climate Change is now a centrepoint of convergence, with the potential of defining a new era in multilateral arrangements.

All BASIC countries (Brazil, Spouth Africa, India and China) together are playing a defining role in the Climate Change negotiations. Contestations between the developed countries and BASIC countries have sharpened over shouldering the responsibilities under the UNFCC. The BASIC countries are united to protect the equity-based Framework Convention and the Kyoto Protocol. The BASIC common position on Climate Change negotitions is in variance from the position of the BRICS countries—which is an emerging economy grouping with Russia, and sharing common interests with Brazil, India, China and South Africa but differing on Climate Change. Being a major exporter of hydrocarbons, Russia has altogeter a different perpsective on carbon emissions.

The potential consequences of alliances—for example India, China and other developing countries—coalescing around carbon emissions, and articulating an Asian multilateral arrangement on restricting emissions rather than reducing emissions has added a new dimension to the international regime on Cimate Change.

Post-Rio+20

In an age of climate stress, discussions on the linkages between nature, conservation, and economic development have intensified. The Rio+20 meet in June 2012, two decades after the original Earth Summit in 1992, tried to provide a sobering assessment on why many of the pledges and decisions of 1992 have not significantly moved beyond the discussion stage. The catch-phrase of the 21st century seems to be global governance; but this is constantly stymied by short-term political gains. Few countries either have the will or the capacity to take responsibility upfront, and electoral politics thwart any effort to make necessary compromises for a fairer and more stable world. In a world

where self-interest takes precedence, game-changing resolutions are hard to achieve.

One major outcome of the Rio+20 meet was *The Future We Want*, a 49-page declaration.[27] The document focused on the development path, and identified wide-ranging priorities with stress on 'sustainable consumption and economic development'. As a result, two central themes emerged: the 'green economy', and 'sustainable development governance'. Not only were these difficult to define but were highly contested. The 'green economy'—mentioned in the text and offered as an option for countries to consider—as the new *mantra* of economic development was looked upon with a great degree of suspicion by developing countries, fearing it as a garb for the resurgence of trade protection, and as a condition for the transfer of technology.

Financial institutions and banks consider the 'green economy' as a dream plan. Legitimizing and giving credence to the green economy has commodified ecosystems, thereby giving them the opportunity to finance ecosystems as 'priced or monetised services'. The issue of 'sustainable development governance', and a commitment to chart the new sustainable development goals (SDG) by 2015, had mixed reactions. Assertive blocs of developing countries were fidgety and nervous about commitment to such goals which would run contrary to their growth plans. The text says, 'We resolve to establish an inclusive and transparent inter-governmental process on SDGs that is open to all stakeholders with a view to developing global sustainable development goals to be agreed by the United Nations General Assembly'.[28] Any success towards achieving these goals will depend on how sincere and accountable countries will be in the future.

The Rio+20 did not define the new terms of engagement for sustainability. The disappointment is not isolated. The COP summits in Copenhagen, Cancun, and Durban have all failed to generate any

[27] http://www.stakeholderforum.org/fileadmin/files/FWWEnglish.pdf

[28] Ibid.

credible action plan. Most global intergovernmental processes require consensus on economic policy which is difficult to attain; thus, public expectation is extremely low. The environment is so much related to economics and business that reaching a meaningful agreement is always difficult. One positive that emerged at the Rio+20 was to strengthen the UN environmental decision making bodies (like the UNEP) as well as the protection of oceans beyond exclusive economic zones. Another positive was the active participation of civil society and business groups in becoming important catalysts for change in the future. But, in the more immediate term, Climate Change is about power relationships and the intricate linkages to issues of economics, politics, security, and science. There is, thus, a perceptible divide between the perceptions of the problem, and the perceptions of the solution. So far, global efforts lack answers to critical questions such as 'which' solutions will be acceptable; who will 'support' them and who will 'resist' them; and the 'cost' involved, etc.[29]

Clearly, Climate Change and development issues are highly divisive and emotive, and hence, it is difficult to reach a consensus. There is a structural flaw in the process of global environmental diplomacy. Stalling the process rather than reaching an agreement is an objective for many countries. For example, it is a well known fact, in such summits, US strategy is to sabotage equity issues. In the COP17 meet at Durban, this strategy was aggressively pursued by the Obama administration. Groupings too have often clashed than come to a consensus. Earlier, the affluent OECD countries could together hijack the agenda and dictate terms. It is no longer so. Similarly, the G77 developing countries find it difficult to hold on to their common objectives. Likewise, the BASIC and BRICS groupings have very little in common, except that Brazil, China and India are categorized as emerging economies. Each of these countries has very different interests, and lack cohesiveness as

[29] See, Uttam Kumar Sinha, 'Sustainable Development and Climate Change: Rio+20 Outcome and the Climate Negotiations', *Indian Foreign Affairs Journal*, Vol.7, No. 3, July-September 2012, p.257-265

a negotiating group.[30] At Rio+20, the G77+China and the BASIC showed resilience in working towards a common minimum position. But these bondings are specific and temporary.

The question of inequity grapples the international system that has been dominated by many conflicting values and interests. The developing countries clearly perceive that past interactions with the rich developed world as having been non-beneficial. For the developing countries, the norms, particularly on morality and justice, still remain unchanged and, thus, the whole context of rich-poor relations is perceived to be not beneficially defined. Impatience and frustration in not seeing the international system radically restructured has led many developing countries to bloc, or stage protests, on trade, development and climate negotiations. Not surprisingly, the principles of equity were equally contentious in Rio+20. It is crucial that any forward movement on sustainable development governance addresses the glaring gaps between rich and poor countries as well as the rich and the poor within countries. Sustainable development cannot be achieved without equitable growth.

Per capita emissions, an important methodology to determine equity and justice in the climate negotiations, form the bedrock on which many developing countries, including India, hang their argument. It is similar to 'one person, one right' principle. For example, China is the biggest emitter; but, in per capita terms, it is probably 95th. Likewise, India, 4th in total emissions, is well below even China in per capita emissions. The equity principle—where everyone in the world would get the same quota of emission permits—has been a driving force in climate negotiations.

Equally, the Common but Differentiated Responsibility (CBDR) and poverty eradication remain critical in the negotiation process, with the emphasis being on 'differentiated' and not on 'common'. With Rio+20, the principles of Agenda 21, guided by multilaterally agreed norms, was reinstated with rebalancing state, society, and economy, and focusing on consumption and production patterns.

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[30] Chandrashekar Dasgupta, 'Climate Change Negotiations: Guarding the "Overriding Priorities"', *Indian Foreign Affairs Journal*, Vol. 6, No.2, April-June 2011, pp. 217-229.

Financial commitment and the transfer of technologies from the rich industrialised countries is also defining the geopolitical landscape. Financial and technological resources are crucial for developing countries to pursue the sustainable path. The Rio+20 Declaration includes the setting up of a 30-member inter-governmental committee to advise the United Nations General Assembly (UNGA) on ways to mobilise resources, reinstating Agenda 21 of 1992. To recall, the Global Environment Facility (GEF) was established in 1991 as a programme of the World Bank to assist the sustainable development programmes. It was reformatted in 1992 as a financial mechanism for both the UN Convention on Biological Diversity and the UN Framework Convention on Climate Change. It subsequently served as a financial mechanism for the Stockholm Convention on Persistent Organic Pollutants (2001), and the United Nations Convention to Combat Desertification (2003). The decision to make the GEF independent, and a permanent body not influenced by World Bank structures, enhanced the involvement of developing countries in the decision-making process and in the implementation of projects.

At the COP14, the GEF identified technology transfer as a long-term priority, and was renamed as the Poznan Strategic Program on Technology Transfer. In a decision, it noted that it is 'a step towards scaling up the level of investment in technology transfer in order to help developing countries address their needs for environmentally sound technologies', and recognized 'the contribution that this strategic programme could make to enhancing technology transfer activities under the Convention.'[31]

At both the mitigation and adaptation levels, the transfer of low-carbon technologies should be seen as a strategic objective. At the global level, the argument should be channeled towards strengthening the Global Environment Facility (GEF) Climate Change strategy. Developing

[31] See, http://www.thegef.org/gef/TT_poznan_strategic_program. Accessed on December 10, 2012

countries, irrespective of their groupings and alliances, should come together strongly on this to make technologies accessible at affordable prices. The Green Economy in the context of Sustainable Development and Poverty Eradication (GESDPE) should help in the facilitation of the transfer of technologies at concessional terms. As the modalities of the 'green economy' and global partnership for sustainability get underway, a creation of an additional sustainable development fund would be appropriate, an idea that India has mooted. GEF is already a streamlined body but needs to improvise its communication strategy and its engagement with potential donors. However, one has to be careful that technological dependence does not become a technological burden, and spill into trade-offs and bargains, which is quite likely.

Summing up

The geopolitical terrain that Climate Change defines are undulating. In the first place, it is the ideological context in which the global climate regime evolves that determines the direction. While global institutions exercise a normative influence, it is interest-led behaviour that defines the processes. The end objective of a climate governance framework is to deliver global public good of a sustainable climate. Secondly, power differentials, relationships and a confluence of interests between actors significantly influence final policy outcomes. Third, if climate governance is the desired objective based on delivering global public goods, then efforts to build a goal-based climate governance architecture that is transparent and accountable is a necessity.

Climate Change and the Geopolitical Orientation in the Arctic: Initial Readings

The impact of Climate Change and the opening up of the Arctic has become a theatre for geopolitical struggle. As explained earlier, the geo-politics of Climate Change has re-ordered the world into 'blocks and brics' defined through states' interests. The same can be witnessed in the Arctic. An initial reading of the geopolitical orientation of the Arctic is explained below.

With the melting of the ice, the attraction for resource exploitation and the benefits of sea routes is changing the profile of the Arctic,and transforming it into a high stake area of cooperation and competition.

The global shift towards the Asia"Pacific has also meant that, geopolitically, the Arctic is no longer distant and remote, particularly now with China, Japan, South Korea, India and Singapore actively involved as Permanent Observers in the Arctic Council. Clearly, the Arctic is becoming accessible to a number of different actors with varied, and not mutually beneficial, agendas.

'Planetary powers' like India and China, currently being driven by energy-intensive growth, will require a constant and stable supply of energy. Thus, the high north can potentially be a hot destination for them. Simultaneously, the potential impact of the new trade routes will strongly attract China, Japan, and South Korea, though Singapore might find its position of a maritime hub dented. While the new non-littoral actors will open up Arctic politics with their increasing participation, the old traditional Arctic states, with their territorial and maritime claims, are expected to bring in disagreement and tension.

Russia would look at the vast expanse of the Arctic from a resource perspective, and export energy to become economically competitive. Vladimir Putin has often expressed Russia's deep interest in the Arctic, and warned of the dangers of militarization in the region. In a sense, Russia has blown the bugle, prompting other interested states not to lower their guard in the Arctic. China will be a big game changer in the Arctic, and Beijing's assertive approach in the South China Sea foretells that the Arctic is going to be its core interest, and that it will seek both cooperation and competition with the Arctic states.

The conflicting claims in the South China Sea and the East China Sea are of similar nature to those in the Arctic. China, the major actor in the Asian seas contesting Vietnam and Japan, will now have to also contend with Russia. For Russia, the Arctic is critically important; but it lacks the capital and the technology to exploit its resource potential and, therefore, seeks cooperation with other western Arctic countries. China, on the other hand, has the economic muscle to push into the Arctic. The equation between the two giants will shape the geopolitical contours in the Arctic.

Another important traditional actor with the largest area in the Arctic is Canada. In fact, Canada and Russia account for 75 per cent of the Arctic Ocean's coastline. Both countries claim the channels between

their Arctic islands and northern coasts as 'internal waters' where foreign vessels require permission to enter.[32]

The consequences of the transformation taking place in the Arctic are of great relevance to Canada. Challenges to Canada's command of the Arctic have been made in the past, particularly by the USA, and it is likely that new contestations over resource exploitation and development, and the right of transit in the Northwest Passage will be made in the future. The USA has always scoffed at Canada's claims, insisting the Northern Sea Route and the Northwest Passage are 'international straits'. In effect, Canada's sovereignty and security can be challenged. It is generally felt that Canada is awakening from its Arctic slumber to 'enforce and ensure its sovereignty and security in the Canadian Arctic.'[33]

Climate Change and World Energy Outlook

We live in an interconnected world with interlinked issues. Three regular challenges keep emerging: meeting global energy needs; providing abundant clean water; and maximizing the productivity of agriculture. In a sense, these have become the core challenges of humanity. Without access to energy, there can be no development. The key global challenge is to provide sustainable energy for all—energy that is accessible, affordable, cleaner, and more efficient. These are interlinked, and require broad-based participation by government (comprehensive national policy), industry (energy efficient), investors (money for clean technologies), knowledge sector (new research), civil society (advocacy and transparency), and the media (awareness).

19th century growth was powered by coal; oil became the driver of the 20th century economy. The utilisation of both these sources have contributed to carbon emissions and impacted global climate (coal,

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[32] *Toronto Star*, January 13, 2010. See, http://www.geopoliticalmonitor.com/arctic-a-growing-security-issue-for-us-3313/

[33] Joe Huebert, 'Canadian Arctic Sovereignty and Security in a Transforming Circumpolar World: Foreign Policy for Canada Tomorrow', *Canadian International Council*, No. 4, July 2009.

mainly for electricity generation, accounts for 44 percent of CO_2 emissions; oil, used primarily for transportation, accounts for 36 percent; and natural gas, used for electricity and heating, accounts for the remaining 20 percent).[34]

Evidence increasingly points out that global warming is worse than predicted, and that global emissions must peak by 2015 if climate changes and the resulting social chaos is to be avoided. Policies towards a sustainable post-carbon world can emerge from the understanding of the science of Climate Change, and not by political and economic expediency. Therefore, it should interest everyone to know how the energy world is likely to develop.

Driven by the rise in fossil fuel process, oil insecurity and climate instability, a new world energy outlook is emerging. It is not going to be a shift from oil, coal, and natural gas (these primary sources will remain important), to an increasing emphasis on an economy powered by cleaner energy. The 21st century is about designing a carbon-and-pollution-free energy economy.

Global warming that goes much beyond absorbing capacity of nature is bringing about a set of dangerous consequences. Scientists believe that Greenhouse Gas Emissions (GHG) emissions have already reached levels where some debilitating climate changes are inevitable. Atmospheric CO_2 concentrations have increased by almost 40 per cent since pre-industrial times— from approximately 280 parts per million by volume (ppmv) in the 18th century to 400 ppmv in 2013. The current CO_2 level is higher than it has been in at least 800,000 years.[35]

According to the US Geological Survey (USGS), human activities now emit over 30 billion tons of CO_2 every year, which is 135 times as

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[34] Lester Brown, 'The Great Transition, Part 1: From Fossil Fuels to Renewables Energy'. See, http://www.earth-policy.org/plan_b_updates/2012/update107. Accessed on December 14, 2012

[35] http://www.epa.gov/climatechange/science/causes.html. Also, National Research Council, *Advancing the Science of Climate Change*, The National Academies Press,Washington D.C.: USA, 2010.

much CO_2 as volcanoes each year.[36] This accumulation in the atmosphere is like water filling a tub, where the inflow is more than the outflow in the drain. Atmospheric carbon concentration at over 390 ppm, and the global commitment to limit the temperature rise of 2ºC., appears to be already lost. The effect of this will, however, only manifest after 20-30 years.

Thus, the dilemma is how to balance the increasing demand for energy with the need to reduce atmospheric GHG emissions. In other words, how can the world ease off its energy demand and allow a shift to clean energy. For South Asian developing countries, with serious energy shortages and high vulnerability to Climate Change, the biggest challenge will be to move towards a 'Low Carbon Energy System' without sacrificing the imperatives of socio-economic development. Therefore, all these countries must concentrate on leveraging the vast renewable energy potential of wind and solar technology, and radically revise their national developmental plans with enhanced funding for the latest clean technologies to achieve the objectives effectively.

An argument repeatedly underlined by the IEA is the need for an energy revolution—a revolution that is not driven by concerns for Climate Change only, but equally by the need for the security of long-term energy supplies at affordable and stable prices. The growing emphasis on energy efficiency and clean energy to enhance effective carbon abatement regimes is crucial.

The importance of new energy technologies to achieve energy security and environmental sustainability cannot be underplayed. However, how the future will unfold in the form and quality of energy technology innovation is unclear. Already, advancement in technology is seeing forward movement, particularly in the renewable sector. Energy will be the one of the first applications to gain traction with the development of nanotechnology. Developments in nanotechnology will help energy

[36] Ibid.

solutions through more efficient lighting, fuel cells, hydrogen storage, solar cells, locally distributed power generation, and decentralized generation and storage by reinventing the power grid. But, to be successful, it has to do so as a low-price high performance choice. Cost is critical, but not a complete dampener. For developing countries, clean a energy supply system is still a dream.

Promoting energy efficiency and demand-side management for sustainable development is another critical factor that is changing the energy outlook. In the 1980s, demand-side management was widely debated as the alternative to supply side over use, and over-spending in energy. The demand- side approach in energy meant ways to reduce demand, focus on conservation, and to shift demand from peak periods to off-peak periods (load management)—in other words, resource optimization. Energy economics in the 21st century world is no longer the only policy driver. Environmental concerns, global Climate Change, and grid reliability/security have become important market and policy issues. There is far greater awareness and concern among various stakeholders, including decision-makers and the public. In addition, technology opportunities are developing, allowing for more sophisticated means of applying intelligence and communication in the power systems, and also for making use of small scale renewable resources in tandem with demand-side management and efficiency. In the 21st century, with the imperative demand to create sustainable energy systems in order to prevent Climate Change and, at the same time, provide more welfare to more people, demand-side planning has to be re-invented as a tool. In doing so, the wide application of demand-side application will generate more efficient and more innovative energy technologies. According to IEA, 'demand-side activities should be active elements and the first choice in all energy policy decisions designed to create more reliable and more sustainable energy systems.'[37]

[37] IEA-DSM, http://www.ieadsm.org/Content.aspx?ID=1233. Accessed on December 13, 2012

Changing Energy Scenario: Global Trends

Reliance on Coal: Mixed Trend

Once the number two coal consumer after China, US coal use dropped 14 per cent from 2007 to 2011 as dozens of coal plants were closed. This trend is expected to continue due, in part, to widespread public opposition to coal and because of strong federal environmental regulations. Natural gas has been a major disrupter of coal as well. The boom in shale gas production has driven natural gas prices lower. Power plant owners are trying to keep some of the plants operational through new 'clean coal' technologies. Big coal producers, like Arch Coal and Peabody Energy, are shifting their activities overseas, where coal-fired power plants are being built. Between 2007 and 2011, carbon emissions from coal use in the US dropped 10 per cent, and from oil use by 11 percent. In contrast, carbon emissions from natural gas use increased by 6 per cent. The net effect of these trends was that US carbon emissions dropped 7 per cent in four years. [38]

However, for emerging economies like China and India, coal remains a reliable, inexpensive and the most important fuel for producing electricity. It is reported that, in China, the demand for coal in 2010 resulted in a traffic jam 75 miles long caused by more than 10,000 trucks carrying supplies from Inner Mongolia.[39] India is increasing coal imports. The big advantage of coal is the low cost. Estimates suggest that coal still costs about one-third the price of renewable energy like wind or solar. From 2012 to 2016, the global demand for coal will grow from 7.9 8.9 billion tons to 8.9 billion tons. 70 per cent of that increase (700 million tons) will come from China.[40] China is expected to add 240 gigawatts within the next four years, adding about 160 new

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[38] Lester Brown, "US Carbon Emission Down 7 Percent in Four Years", Earth Policy Institute, November 2, 2011. http://www.earth-policy.org/plan_b_updates/2011/update101

[39] The New York Times, November 12, 2012. http://www.nytimes.com/2012/11/13/business/energy-environment/china-leads-the-way-as-demand-for-coal-surges-worldwide.html?_r=0

[40] Peabody Energy Study, http://www.peabodyenergy.com/content/145/Peabody-in-China

coal-fired plants to the existing 620. During that period, India will add an additional 70 gigawatts through more than 46 plants.[41]

In the Climate Change debate, oil is not the real villain—not when compared to coal. Roughly oil is used to produce only 5 per cent of the world's electricity generation and the process is becoming ever more costly. Since oil is used for transport, it can be gradually eased by electrifying the transport system or moving towards plug-in hybrid and all-electric cars, run largely on clean electricity. Calculations by the Worldwatch Institute suggest that wind-generated electricity to operate cars could cost the equivalent of 80-cent-per gallon gasoline. Recently, the scientific community is challenging the natural gas industry's claim that its product is fairly climate-benign. Natural gas produced by hydraulic fracturing, or fracking (a much-touted key to expanding production) is even more climate-disruptive than coal because of methane gas leakage, and methane is a potent contributor to Climate Change.

Nuclear Power: A Question Mark

Once touted as being 'too cheap to meter', nuclear power has come under introspection. Marking the anniversary of Fukushima in its March 10, 2012 issue, *The Economist* noted: 'Nuclear Power: The dream that failed'. Although nuclear reactors supply 13 per cent of the world's electricity, nuclear power's role in our future will be limited. Price is one factor; public perception is another, the latter affecting policy post-Fukushima in March 2011. While this did not happen in the USA, but in countries like Germany the effect was profound: Chancellor Angela Merkel announced the immediate shutdown of eight of the country's oldest reactors in 2011. It was reported in the *New York Times* that China suspended approvals for new reactors, pending a safety review.[42] The news report says that,

> This has resulted in a downward revision of China's unofficial pre-Fukushima goal to install 86 gigawatts of nuclear capacity by

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41 Ibid.

42 Stephen Cooke, 'After Fukushima, Does Nuclear Power have Future?', *New York Times*, October 10, 2011

> 2020. It now looks like that will be set around 60 gigawatts (up from around 12 currently) or just a little higher.[43]

Taiwan too has considered a phase-out of its four reactors. Israel and Venezuela have calmed their earlier nuclear power ambitions, post the Fukushima incident. In Japan—and not surprisingly—the nuclear 'capacity factor' has dropped sharply from 71 per cent in February 2011, to 51 per cent in May. While the trend post-Fukushima is definitely not encouraging, the London-based World Nuclear Association predicts a 30 per cent increase in global nuclear generating capacity by 2020-2022, and foresees 79 more reactors online by 2020, for a total of 514.[44] By 2030, it predicts a 66 per cent increase, additions mainly coming from China, India, South Korea and Russia. Be that as it may, the nuclear energy debate has intensified, and is becoming the energy of protest in some democratic countries. When one factors in safety, land acquisition, and the issue of long-term nuclear waste storage, the industry is not as cheap, energy efficient, and environmentally friendly as is often claimed. With nuclear energy in a dilemma, renewed thinking is moving towards renewables.

E*nergy Independence or Energy Interdependence?*

Countries like the USA are moving towards energy independence, which has been one of its primary objectives since the Nixon 'energy independence project' in 1973. The Internaltional Energy Agency (IEA) predicts that US oil production will reach 11.1 mm barrels a day in 2020, making it the world's largest oil producer, out producing Russia and Saudi Arabia.[45] It is expected that, increased oil production, combined with the growing production of natural gas, will help the USA achieve energy independence by 2023—the USA will export more energy than it imports. The USA is estimated to have enough gas to sustain its current rate of production for more than a century.

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[43] Ibid.

[44] World Nuclear Association, 'Nuclear Century Outlook', http://www.world-nuclear.org/outlook/clean_energy_need.html

[45] IEA World Energy Outlook (WEO) Executive Summary, 2012. http://www.iea.org/publications/freepublications/publication/English.pdf

On the other hand, China's increasing dependence on oil imports, and the need to secure and diversify oil supply, are driving Chinese NOCs to invest in international projects, and form strategic commercial partnerships with the IOCs.

According to IEA, China is the world's second largest oil consumer behind the USA, and the largest global energy consumer. Since 2009, it is the world's second largest net importer of oil. Natural gas usage in China has also increased, and is looking to raise natural gas imports via pipeline and liquefied natural gas (LNG). Given its enormous energy requirement, China will want to make sure that it has sufficient physical stake in oil and gas globally.

On the oil front, Chinese NOCs are continually playing catch-up to meet the 9.9mb/d demand. As the biggest overall consumer of energy in the world, no one is in any doubt that China has to step up equity deals, both for the security of supply and, more importantly, to hedge price risk exposure in the future. China also gets about half its oil imports from the Gulf.

While the USA is becoming increasingly energy independent, and China has significant reserves, India's energy dependency will not reduce. This would pose significant challenges for India. This also opens opportunities for India to make transition to a knowledge based economy. Focusing on alternative energy resources will require significant research and development (R&D which in turn requires two primary conditions—educated professionals and investment.

The Hydrocarbon Race

The demand and supply of oil is clearly a geo-political issue. The uneven distribution of oil resources, found in few geological locations but with demand that is widespread, makes it a strategic resource. For a majority of countries, energy policies are strategic policies. Oil is also the most traded commodity, and any fluctuation in price or political disruption impacts the economic health of countries hugely. The strategic significance of oil will continue to define international relations and policy agendas of countries.

Looking at increasing energy needs of Asian countries, especially India and China, it is clear that with the two countries expected growth rate

the demand for energy will increase by almost 10 per cent from the current consumption rate to 38 per cent by 2030. This means critically heavy dependence on imported oil. Broadly, Asian countries, together with China and India, will consume 40 per cent of the world's oil. This is a huge requirement, and relates directly not only to supply security but also to the security of routes.

Both sea and land routes through which oil pipelines pass will assume greater security significance. Supply routes through the Malacca straits, the straits of Hormuz, Bab el Mandeb, and the Suez Canal are potentially vulnerable to terrorist attacks and political instability, and thus could threaten the flow of oil to Asian countries.

Closer to Asia, the dispute around the Spratly Islands in the South China Sea can equally disrupt the supply of oil. Peace and stability are essential for the uninterrupted flow of oil. China, Taiwan, Vietnam, the Philippines, Malaysia and Brunei all have competiting claims on the potential oil and gas resources in the region, and the political tensions and uneasiness can create hinderances to tanker traffic. The route through the South China Sea supplies a huge volume of oil to China, Japan and South Korea. China, which is a prime claimant to the disputed islands, realises the cost of supply disruption, and has restrained itself from escalating the issue. Even for a powerful country like China, the vulnerability to supply routes is a reality.

While undoubtedly energy security has shifted from the traditional demand and supply matrix to a more enlarged and enlightened understanding greatly influenced by Climate Change, the fact and reality is that the search for oil will continue, and any new find/discovery will carry the same classical geopolitical orientation of competition and contestation. Carbon-saving technologies will be an important intervention to energy security,[46] balancing high cost items like carbon sequestration and nuclear energy with lower cost options like energy

[46] Nitin Desai, 'The New Race: Energy and Climate Change', *India Quarterly*, New Delhi: Sage, 64(1-3), January 2008, pp.113-114

efficiency and renewables. If energy has to be desecuritised, then technological competence has to come in strongly. Even for the Asian countries, pooling knowledge and finding solutions to the energy dilemma is a rational alternative to reducing their oil dependency and increasing self reliance. But, in the immediate term, the energy race for oil possession and concession will continue, and therefore, the opening of the Arctic to potential hydrocarbon resources is far too tempting to ignore.

Summing Up

The global energy market is dynamic, with a great diversity of developments resulting from the changing resource situation as well as technology setups and investment. Energy efficiency is a 'key option' and a 'game changer' in placing global energy systems onto a more sustainable path. One important factor in becoming self-sufficient in energy is the need for countries to focus on reducing energy intensity as they industrialize their economy. Wind, solar, and other types of low-carbon energy will remain attractive; but it will take a while for policy to accommodate both traditional fossil fuel energy and renewables. Future energy policies will have to focus both on conserving energy and changing the energy mix. To reach this goal, governments will have to be innovative and smart, and impose taxes for resource consumption and fines for ecological damage. The combination of rising populations, increased urbanization, and rapid economic growth compounds the challenges of securing energy in the future. Asia's energy demand will grow more rapidly than other regions, reflecting its high economic growth. The total primary energy demand in Asia will reach 9.0 Btoe in 2035, a 2.1-fold increase from 2008. The figures indicate that by 2035, Asia's share in the world primary energy demand will be 50 per cent. [47]

[47] Ryoichi Komiyama, "Energy Outlook to 2035 in Asia and its Pathways Towards a Low Carbon Energy System, The Institute of Energy Economics, Japan. http://www.worldenergy.org/documents/congresspapers/174.pdf

As a result, Asia will face numerous energy stresses. With an additional 500 million people expected in the next 10 years in South Asia alone, the stress on energy requirement will only multiply. Meeting the humongous energy requirements will be the greatest policy challenge.

Climate Change and Energy Outlook in the Arctic: Initial Reading

Probably the most significant impact of the warming of the Arctic has been to undercover the vast resources lying beneath the ice, and making the Arctic a promising frontier for energy development. Unexplored energy resources have always gained attention, and it is not surprising that, from an economic resource perspective, energy consumers always welcome any additional resources.[48] Rough estimates suggest that 25 per cent of the world's undiscovered oil and gas is in the Arctic.[49] With ice-free waters allowing for easier and shorter navigation, the commercial attraction is high. However, the energy-climate change conundrum sits heavily on the Arctic as elsewhere, with warming and increased human activity posing significant challenges to the fragile ecosystem and the indigenous people. Also, the question of commercial viability is important, as with any energy resources. Early economic estimate point to the fact that onshore oil and natural gas projects in the Alaska Arctic is 50-100 per cent more than similar projects undertaken in Texas.[50]

The reality of extracting Arctic oil and gas deposits is a challenging process, and is often overlooked in analyses. Resource development

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[48] Dag Harald Claes and Øistien Harsem, 'Arctic Energy Resource: Curse or Blessing for European Energy Security?' Working Paper, 'GeoPolitics in the High North'. See, http://www.geopoliticsnorth.org/images/stories/attachments/claes_harsem.pdf

[49] The Arctic holds an estimated 13% (90 billion barrels) of the world's undiscovered conventional oil resources, and 30% of its undiscovered conventional natural gas resources, according to an assessment conducted by the U.S. Geological Survey (USGS). See US Energy Information Administration. http://www.eia.gov/todayinenergy/detail.cfm?id=4650

[50] Ibid.

has to contend with the harsh weather in the Arctic, and requires advanced and specialised equipment to withstand frigid temperatures. Also, a large inventory of spare parts is required to ensure reliability. Given the risk factor and the remoteness of the Arctic, employees expect higher wages and salary. There are clearly natural hazards and operational problems for drilling wells in both onshore and offshore Arctic areas. On the economics front, while the Arctic region is stocked with natural gas, the extraction of the resource 'can be impeded by the low market value of natural gas realtive to that of oil'.[51] Since the large gas consumers live quite far from the Arctic region, the costs of transportation of the gas are much higher, thus making it less attractive than oil. Moreover, as described earlier, the Arctic is riddled with disputed claims of sovereignty that impede resource development. Along with the territorial and political challenges, resource governance, environmental stewardship and regulatory permits also affect the exploration and production of Arctic resources. Environmental issues cannot be excluded from resource development. The Arctic has a unique eco-system that needs to be protected. This is particularly so for the marine environment which, because of the increased activity in oil and gas exploration and shipping, could lead to oil spills which could be hugely damaging, and very difficult to clean up among ice floes.

In the post Rio+20 world, integrating Climate Change, sustainable development and security is critically important. The relationship between Climate Change and access to new areas of energy that will impact on standards of living as well as aggravate existing tensions needs to be carefully evaluated. In the context of global ecological limits, global concern should focus on balancing resource governance with prosperity, and promoting collaboration.

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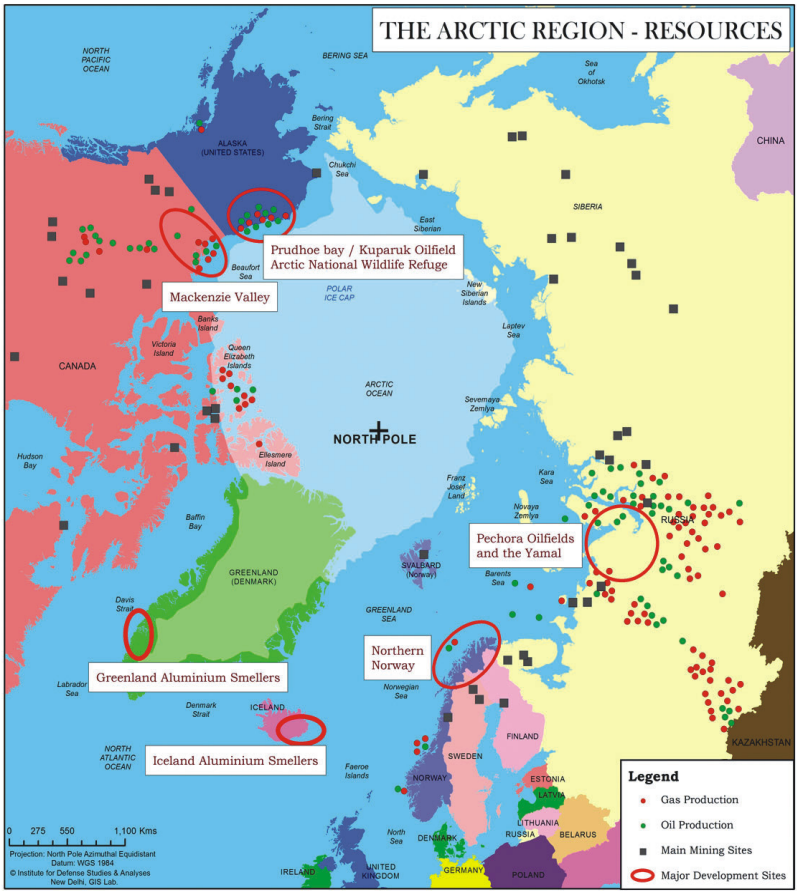
[51] Ibid.

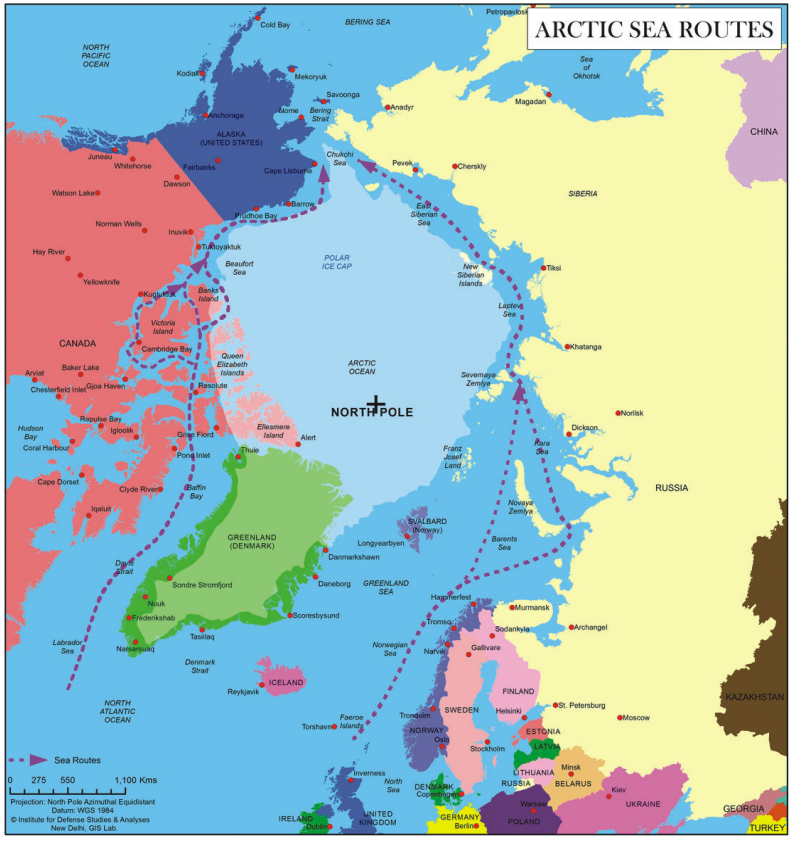
Map 1


THE ARCTIC REGION
BERING SEA
NORTH PACIFIC OCEAN
Cold Bay
Kodiak
Mekoryuk
Savoonga
Nome
Bering Strait
Anchorage
ALASKA (UNITED STATES)
Juneau
Whitehorse
Fairbanks
Dawson
Watson Lake
Norman Wells
Inuvik
Hay River
Yellowknife
Kugluktuk
Tuktoyaktuk
Beaufort Sea
Banks Island
Victoria Island
CANADA
Cambridge Bay
Baker Lake
Arviat
Chesterfield Inlet
Gjoa Haven
Queen Elizabeth Islands
Resolute
Repulse Bay
Igloolik
Hudson Bay
Coral Harbour
Grise Fiord
Ellesmere Island
Alert
Thule
Pond Inlet
Cape Dorset
Clyde River
Baffin Bay
Iqaluit
GREENLAND (DENMARK)
Davis Strait
Sondre Stromfjord
Nuuk
Frederikshab
Tasiilaq
Labrador Sea
Narsarsuaq
Denmark Strait
ICELAND
Reykjavik
NORTH ATLANTIC OCEAN
Torshavn
Faeroe Islands
IRELAND
Dublin
Inverness
North Sea
UNITED KINGDOM
DENMARK
Copenhagen
GERMANY
Berlin
POLAND
Warsaw
Daneborg
GREENLAND SEA
Danmarkshavn
Longyearbyen
SVALBARD (Norway)
Barrow
Prudhoe Bay
Cape Lisburne
Chukchi Sea
Pevek
Cherskiy
Anadyr
Petropavlovsk
Sea of Okhotsk
Magadan
CHINA
SIBERIA
East Siberian Sea
POLAR ICE CAP
ARCTIC OCEAN
NORTH POLE
New Siberian Islands
Tiksi
Laptev Sea
Khatanga
Severnaya Zemlya
Franz Josef Land
Barents Sea
Kara Sea
Norilsk
Dickson
RUSSIA
Novaya Zemlya
Hammerfest
Tromso
Murmansk
Archangel
Sodankyla
Gallivare
Norwegian Sea
Narvik
Trondelm
NORWAY
Oslo
SWEDEN
Stockholm
FINLAND
Helsinki
St. Petersburg
Moscow
ESTONIA
LATVIA
LITHUANIA
RUSSIA
BELARUS
Minsk
Kiev
UKRAINE
KAZAKHSTAN
GEORGIA
TURKEY
0 275 550 1,100 Kms
Projection: North Pole Azimuthal Equidistant
Datum: WGS 1984
© Institute for Defense Studies & Analyses
New Delhi, GIS Lab.

Map 2


THE ARCTIC REGION - RESOURCES
NORTH PACIFIC OCEAN
BERING SEA
Sea of Okhotsk
Bering Strait
ALASKA (UNITED STATES)
Chukchi Sea
CHINA
SIBERIA
East Siberian
Prudhoe bay / Kuparuk Oilfield
Arctic National Wildlife Refuge
Beaufort Sea
Mackenzie Valley
POLAR ICE CAP
New Siberian Islands
Laptev Sea
Banks Island
Victoria Island
Queen Elizabeth Islands
CANADA
ARCTIC OCEAN
NORTH POLE
Severnaya Zemlya
Hudson Bay
Ellesmere Island
Franz Josef Land
Kara Sea
Novaya Zemlya
RUSSIA
Pechora Oilfields and the Yamal
Baffin Bay
GREENLAND (DENMARK)
SVALBARD (Norway)
Barents Sea
Davis Strait
GREENLAND SEA
Northern Norway
Greenland Aluminium Smellers
Labrador Sea
Norwegian Sea
Denmark Strait
ICELAND
FINLAND
KAZAKHSTAN
NORTH ATLANTIC OCEAN
Iceland Aluminium Smellers
Faeroe Islands
SWEDEN
NORWAY
ESTONIA
LATVIA
LITHUANIA
RUSSIA
BELARUS
North Sea
DENMARK
IRELAND
UNITED KINGDOM
GERMANY
POLAND
0 275 550 1,100 Kms
Projection: North Pole Azimuthal Equidistant
Datum: WGS 1984
© Institute for Defense Studies & Analyses
New Delhi, GIS Lab.
Legend
Gas Production
Oil Production
Main Mining Sites
Major Development Sites

Map 3


ARCTIC SEA ROUTES
BERING SEA
NORTH PACIFIC OCEAN
Cold Bay
Kodiak
Mekoryuk
Savoonga
Anchorage
Nome
Bering Strait
ALASKA (UNITED STATES)
Juneau
Whitehorse
Fairbanks
Dawson
Watson Lake
Cape Lisburne
Chukchi Sea
Barrow
Prudhoe Bay
Norman Wells
Inuvik
Tuktoyaktuk
Hay River
Yellowknife
Beaufort Sea
POLAR ICE CAP
Kugluktuk
Banks Island
Victoria Island
CANADA
Cambridge Bay
Queen Elizabeth Islands
Arviat
Baker Lake
Gjoa Haven
Chesterfield Inlet
Resolute
ARCTIC OCEAN
NORTH POLE
Repulse Bay
Igloolik
Hudson Bay
Coral Harbour
Grise Fiord
Ellesmere Island
Alert
Pond Inlet
Thule
Cape Dorset
Clyde River
Baffin Bay
Iqaluit
GREENLAND (DENMARK)
Davis Strait
Sondre Stromfjord
Nuuk
Frederikshab
Scoresbysund
Tasiilaq
Labrador Sea
Nanortalik
Denmark Strait
ICELAND
Reykjavik
NORTH ATLANTIC OCEAN
Longyearbyen
Danmarkshawn
Daneborg
GREENLAND SEA
SVALBARD (Norway)
Barents Sea
Franz Josef Land
Severnaya Zemlya
Novaya Zemlya
Kara Sea
Laptev Sea
New Siberian Islands
East Siberian Sea
Petropavlovsk
Sea of Okhotsk
Magadan
Anadyr
Pevek
Cherskiy
SIBERIA
Tiksi
Khatanga
Dickson
Norilsk
RUSSIA
CHINA
KAZAKHSTAN
Hammerfest
Murmansk
Tromso
Sodankyla
Archangel
Norwegian Sea
Narvik
Gallivare
FINLAND
Helsinki
St. Petersburg
Moscow
Trondheim
SWEDEN
Faeroe Islands
Torshavn
NORWAY
Oslo
Stockholm
ESTONIA
LATVIA
LITHUANIA
Minsk
BELARUS
RUSSIA
Kiev
UKRAINE
Warsaw
POLAND
GERMANY
Berlin
DENMARK
Copenhagen
North Sea
Inverness
IRELAND
Dublin
UNITED KINGDOM
GEORGIA
TURKEY
Sea Routes
0 275 550 1,100 Kms
Projection: North Pole Azimuthal Equidistant
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Reading the Arctic

How do climate change narratives in the political"security debate relate to the geo-physical changes in the Arctic? How are these changes being viewed by key global actors in relation to the Arctic? The following pages examine the political interplay between the old littoral guards, and the new non-littoral entrants in the Arctic.

The Impact of Climate Change

The melting of Arctic ice is a worrying phenomenon linked directly to Climate Change. Satellite imagery in August 2012 has indicated that the summer sea-ice loss was almost 50 per cent more than earlier estimates.[52] Calculations suggest that the Arctic will be ice-free in the summer around 2050. These are not healthy signs; indeed they are cause for worry and point to the fact that the rise in temperature is now irreversible. Scientifically speaking, the ice melt process has set in, and is described as the 'Arctic amplification' that is, the reduction in the ice cover not only reduces the reflection of the sunlight but also increases the absorption of heat as the darker water gets exposed. Like a 'bellwether'[53] for presaging future happenings, the Arctic is reminding the world that the planet is warming faster, and that the process of melting is accelerating. In terms of climate impact, two serious results have been observed by scientists. First, the shrinking of the Greenland ice sheet (land ice) will raise sea levels, and the thawing of permafrost will increase the potential for the release of methane, a greenhouse gas component.

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[52] 'Rate of Arctic summer sea ice loss is 50% higher than predicted', *The Guardian/The Observer*, 11.8.2012. See, http://www.guardian.co.uk/environment/2012/aug/11/arctic-sea-ice-vanishing. Accessed on August 20, 2012

[53] Rob Huebert, Heather Exner-Pirot, Adam Lajeunesse and Jay Gulledge, *Climate Change and International Security: Arctic as a Bellwether*, Centre for Climate and Energy Solutions, May 2012. See, http://www.c2es.org/docUploads/arctic-security-report.pdf

Second, the decline in sea ice will have a circulating impact on weather patterns in the northern hemisphere's middle latitudes. For Asia, the Himalayan watershed and the Monsoon weather pattern will be much exposed to the impact of the Arctic melting. How severe the impact will be needs to be further studied, and therefore given the vulnerability of Asian countries to climate changes, their involvement in Arctic research is important.

While at one level climate impact on the Arctic is unsettling, at another level the melting of ice is seen as an opportunity offering benefits like the opening of the northern sea passage for shipping, easy access for the exploration of the vast oil and gas resources, and for exploiting the huge fish stock. It is an antithetical situation: commercial-political interests driven by the potential for resource exploration on the one hand, and a climate realisation based on eco-system management that requires governance and sustainable resource use on the other. State policies towards the Arctic will significantly depend on science to estimate the changes. The importance of ongoing research undertaken by the concerned states cannot be underestimated.

Currently, the commercial priorities of fishing, shorter shipping routes, and oil and gas discovery are high, and accompanied them is the realites of geopolitics. Not surprisingly, the Arctic is viewed as a hot destination, a 'gold rush', and an area of 'resource competition'. The semantics found in many of writings on the Arctic are political expressions this belief, with phrases like 'land grab', 'great game moves north', 'high stakes in the High North', etc. being good examples.[54] The literature greatly suggests intensified resource competition and images of chaos. There is a perception that the Arctic is an undefined and unregulated territory, devoid of any laws, and therefore the potential stage for rivalry. While conflict may not be inevitable, divergent and contestable views are likely to put pressure on state relationships and institutional arrangements. The impact of Climate Change in the Arctic is prompting states to debate on resource governance; but, the changing geopolitical dynamics cannot be overlooked.

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[54] Uttam Kumar Sinha, "Arctic: An Antithesis", *Strategic Analysis*, Vol. 37, No. 1, pp.34-35

The Arctic has proved an important Climate Change precursor. Understanding the dynamics of Climatic Change in the Arctic can also help understand the changes in the other parts of the world, particularly Monsoon Asia and the Himalayan Watershed. With the melting of the ice, the Arctic has drawn considerable interest over the last few years. The interest is not only glaciological. The 2008 US Geology Survey's assessment that about 30 per cent of the world's undiscovered oil and gas reserves are in the Arctic[55] have led to an increased energy and commercial interest in the region, and as a consequence, to the potential friction with emerging non-littoral players in the Arctic. The scenarios based on conflict and cooperation have broadened the Climate Change debate from the scientific to the geopolitical. However, while it is expected that geopolitics will sharpen, currently much of the thrust still remains on scientific research.

Cultural anthropology tells us that images and perceptions are a continuous process of creating categories of what is unknown, thus becoming desirable and prestigious. In a sense, the Arctic reflects this. There is also a perception that the Arctic is unregulated and unruly territory, and therefore has the potential for rivalries. The idea of impending conflict may be alarmist, but the presence of contesting views cannot be ignored.

The Arctic has seen a dramatic turnaround from being a destination for research expeditions and a desolate area for missile testing to a hot spot where competition is unavoidable but where cooperation is equally desirable. With satellite images pointing to the fact that the summer sea-ice loss has been significantly higher in 2012 than earlier calculated, one can either be worried with the ominous trends, or pleased with the prospects of profit. Scientific findings and climate modeling further indicate the possibility that, by mid-century, the Arctic would be ice-free in the summer.

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[55] USGS Circum-Arctic Resource Appraisal Assessment Team, 2008 See, http://pubs.usgs.gov/fs/2008/3049/fs2008-3049.pdf

Any serious look at the Arctic cannot ignore the fact that, because of the meltdown, the circumpolar compactness and continuum of the Arctic has given way to an extremely active geopolitical space; that is, the undisturbed ecological qualities that gave the Arctic its physical stability is now being shaken and disturbed by the scramble for resources in which the refrain seems to be 'drill, baby, drill'. These are realities that have to be taken into account when looking at the Arctic. As described earlier, the commercial priorities of fishing, shorter shipping routes and the need for energy have made the Arctic attractive.

Not surprisingly, a number of states—particularly the non-littoral Asian states China, Japan, South Korea and India—have pushed up their activities and are increasingly putting more resources into Arctic research. While research has its purpose, it cannot be denied that it also gives a foothold in the region and provides opportunities to understand political and economic dynamics.

The following pages will focus on some broad geopolitical changes as warming impacts the Arctic ice, as also discuss expansion of the geopolitical landscape of the Arctic by briefly examining the role and interest of Asian countries.

The Arctic: New Climate Change Front

Governance

The changing geophysical profile of the Arctic may have given the impression that it is like the once 'unruly wild west'.However, the Arctic—being 'mostly ocean surrounded by mostly land'—is in fact governed by the UN Laws of the Sea (UNCLOS), just like all other high seas. In fact, even the Antarctica is similarly governed by the Treaty of 1959, which declares the land as a natural reserve devoted to science. So, at both the Polar ends of the planet, there are norms and regulations. Whether the existing set of rules will be able to manage the differences over legal interpretation and resource competition remains to be seen. Geopolitical interests need not necessarily mean contestation; they can also bring about an orderly approach, as for example, the manner in which the Arctic 5 countries (excluding the USA) have submitted (Russia and Norway), or are in the process of submitting (Denmark and Canada) their continental shelf claims to the Commission on the Limits

of the Continental Shelf. The UNCLOS is the bedrock of the governance structure in the Arctic, and clearly defines the principles regarding the limits of national jurisdiction. It must be remembered that when UNCLOS was being drafted, the Arctic ice melt was not factored in; yet the Convention is flexible enough to allow for new physical changes and developments. For example, according to Article 234 of UNCLOS, Section 8 on 'Ice-covered areas':

> "Coastal States have the right to adopt and enforce non-discriminatory laws and regulations for the prevention, reduction and control of marine pollution from vessels in ice-covered areas within the limits of the exclusive economic zone, where particularly severe climatic conditions and the presence of ice covering such areas for most of the year create obstructions or exceptional hazards to navigation, and pollution of the marine environment could cause major harm to or irreversible disturbance of the ecological balance. Such laws and regulations shall have due regard to navigation and the protection and preservation of the marine environment based on the best available scientific evidence."[56]

What needs to be remembered is that the Arctic is the territorial proprietorship of the A5. Unlike Antarctica, where territorial claims are banned, the Arctic region is sectoral. Geopolitical contours are sharp, and these have the potential of getting more pronounced as the melting increases. Arctic literature suggests three big political questions: the first is about the 'ownership' of the Arctic, and 'who' shall extract its energy resources; the second concerns 'delimitation' issues, and 'how' the new maritime boundary will be drawn; the third relates to 'who' will control the new sea routes.

These three specific questions will raise the various dimensions of contestation and cooperation: for example, how the increased shipping traffic in the northern sea route (NSR) will be subjected to design specification and regulation, or how new fishery agreements will be

[56] See, https://www.un.org/depts/los/convention_agreements/texts/unclos/part12.htm

formulated on the high sea. Negotiations within the International Maritime Organisation (IMO) on safety issues and environmental concerns are going to be irksome. All these issues can potentially cause rifts, and impact the balance of power in the Arctic. Even within the Arctic Council, which has worked without much disruption in dealing with circumpolar affairs for many years, might find the differing interpretations difficult to resolve. It is well known that, in spite of being strategic partners, the USA and Canada view the northwest shipping passage differently. Canada claims it as its 'internal waters', while the USA views it as available for 'international navigation', with rights for all ships to have 'innocent passage.'

Of the Arctic 5, the USA has not ratified the UNCLOS since it was opened for signature on December 10, 1982. Though the Obama administration is favourably inclined, the Senate is dogged in its opposition to any ratification. However, in policy circles it is believed that with the Arctic melting and the developments in the South China Sea, the USA would be keen to contribute to maritime order and navigational rights, and thus, the Obama administration's push towards the ratification of the convention.

The role of Asian states, in particular China and its position over the interpretation of UNCLOS, is likely to impact the governance structure in the Arctic. China ratified the convention in 1996, but hesitates—as for example in the case of Spratly islands and Scarborough—to bring it under a dispute settlement mechanism. The Chinese claim to these islands is based on historical records whereas UNCLOS requires countries to surrender such claims, and abide by either the 'territorial waters' (waters under the jurisdiction of the state, traditionally 3 miles) or EEZ (exclusive economic zone having a 200-nautical mile limit). So, while laws exist, they regularly clash with sovereignty. The Arctic too may witness claims and counter-claims before being settled.

Geopolitics

China

Various estimates conclude that the Arctic region holds over 40 per cent of the global reserves of oil and gas. The ice melting has opened up areas for exploration, and the extraction of resources. Shipping through the northern sea route, as compared to the Suez Canal route,

is calculated to cut down the distance by almost 2800 nautical miles, or 22 per cent (between Rotterdam and Shanghai)—a cost saving of over 30-40 per cent.[57] The shortening of the route has greatly interested China, and will also interest South Korea and Japan, the two other Asian countries who would be particularly keen to develop an Arctic policy.

China is a net importer of energy, and the Arctic is clearly a part of its energy calculus. China's long experience in energy engagements overseas gives it a competitive advantage. Chinese energy companies and its influential investment institutions are already engaged on the Norwegian continental shelf. Interestingly, Beijing has started articulating a 'commons' position, that is, no nation has sovereignty over the Arctic, and resources there are for all to exploit and use. While it would be unlikely for the Arctic 5 to agree to such a position, China will continue to push for Observer Status in the Arctic Council, indicating that it has a deep interest in, and values its participation in, the development of the Arctic.

As the northern sea route becomes increasingly ice free, and moves further north, China would want to exploit the situation. This is more so because the Russian authorities have shown their willingness to provide more attractive terms for sailings through the passage. China is a major player in ship building and transport, and therefore, the northern route would mean faster access to markets in Europe and the American east coast; the gaining of access to resources in the Arctic and northern Russia; and obtaining markets for the ship-building industry. These commercial interests are political objectives, and China, as a key player, can significantly reorder the balance of power in the Arctic. Further expansion of Arctic shipping will depend on investment in the navigational infrastructure and icebreaker capacity. Russia's economy is not robust enough to carry out these heavy investments. But, seeking outside participation—for example, from China—would

[57] 'Shipping: Short and Sharp', *The Economist*, June 16, 2012, http://www.economist.com/node/21556803 Accessed on August 20, 2012

not be an easy choice. It would open a whole lot of difficult political and security issues.

It will be interesting to observe how Russia balances its equation with China for facilitating large scale investments. On the other side, Russia can decide to develop warm ties with the USA and NATO, and counter balance China's rise in the Arctic. China, on the other hand, would like an alliance with Russia in order to raise its profile in the Arctic, and undermine US and European interests.

Russia

Historically, Russia has been accustomed to maintaining peace through balancing power. The balance of power principle is almost indispensable to Russian diplomacy. With reference to the Arctic, Russia is aware that the possibilities of 'great power' politics are potentially high. In fact, a resurgent Russia will find the Arctic region a perfect ground to proclaim its power status, and be a counterweight to any power tilt towards the West or towards China. Vladimir Putin has often described Russia as a northern country, emphasising not only the energy and economic importance of the Arctic but also as an international status symbol. The Arctic Strategy of 2008 strongly states the importance of the region as a strategic resource base, and Russia as a lead player in it. Militarily, the Northern Fleet in the Arctic region is probably the most formidable naval force in the world having '…Russia's only aircraft carrier, the world's only nuclear-powered guided missile cruiser and the largest destroyer and anti-submarine warfare (ASW) ship units.'[58]

The northern sea route will give Russia enormous strategic latitude and commercial gains. Amongst the Arctic 5, Russia is the 'odd one out'. The other four states are NATO members, are long standing Western liberal democracies, and thus natural allies. Yet, Russia seems to be in a position to balance the unfavourable equation. It has greater engagement with Norway through the Barents Cooperation, and the recent delimitation agreement has further strengthened relations. With Canada,

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[58] Ilya Kramnik, 'Northern fleet protecting Russian Arctic', RIANovosti, June 2, 2009, http://en.rian.ru/analysis/20090602/155147701.html

it cooperates on ice breakers; and with China, a whole range of Arctic packages can be developed.

Norway-Russia Relations

One of the most interesting relationships in the Arctic is the one between Norway and Russia in the Barents region. The region is Europe's northernmost area of cross-border cooperation between East and West. The 5.5 million inhabitants in the region, which includes Norway, Sweden, Finland and Russia, have shared the benefits of peaceful coexistence. The region has several important natural resources, like minerals, oil and gas reserves, and fish and forest. For Norway, the region is critically important, and has high strategic significance, particularly in relation to Russia. The two share a boundary of 196 kms which has been remarkably peaceful—even at the height of the Cold War rivalry between the West and the East. The Barents Secretariat in Kirkenes, now marking 20 years, has been instrumental in furthering the Norwegian-Russian cooperation in the north. Over the last two decades, the Secretariat has overseen 3000 regional projects.

Given the history of togetherness between Russia and Norway in the Barents, and sensing the need for partnership with the opening of the Arctic, Prime Minister Jens Stoltenberg and President Medvedev took a lot of people by surprise when, in April 2010 (it came into effect in July 2011), they announced that a compromise had been reached by delineating the 175,000 sq km of hydrocarbon and fish resource-rich area in the Barents Sea. It ended the 40-year old dispute, and opened the zone to the potential for greater partnership and cooperation. Russian dependence on Norwegian deep-water hydrocarbon drilling technology, possibly the most advanced in the world, and the shared interest of both countries in exploiting the hydrocarbon resources in the disputed offshore areas can be seen as drivers for the resolution of the dispute. It is estimated that the delimitation zone (referred to earlier as the 'Grey Zone') contains about 25 per cent of the world's hydrocarbons resources. Statoil of Norway is already in partnership with Russian state companies like Gazprom and Rosneft. As Russia seeks new resource gains, it is also simultaneously signalling its willingness to make compromises in its relations its with its neighbours. Russia's border demarcations with Azerbaijan as well as talks with Ukraine over the delimitation of the Azov Sea are solid indicators of this.

Clearly, as can be observed in the Barents, Norway and Russia are the front runners in contemporary European East-West border relations. In May 2012, a visa free regime was introduced in the border areas, with a 30-km zone movement. This is the first time, since the 1920s, that Russian citizens can move across a border with a Western European country without visa. In the Barents, particularly in the Murmansk Oblast area, there is strong public support for greater cooperation, especially in the areas of oil and gas, and mining and metallurgy. In fact, Norway's foreign policy, as stated by the Foreign Minister in February 2012, seems to be scaling down the number of global peace initiatives, and looking closer to its border and increased cooperation with Russia.

Research Activities in the Arctic

There are various dimensions of research in the Arctic often described as 'northern science'. It is largely driven by understanding Arctic as a 'system', and reducing the uncertainty over Climate Change predictions. This section will briefly look at the research activities of non-littoral Asian states (China, India, Japan and South Korea), and how interest in the Arctic has led to policy ascendancy in these countries. This brief section draws information from the Asiarctic Project led by the FNI-IFS, in which IDSA is also a research partner, particularly the research findings of Iselin Stensdal.

Of the Arctic littoral countries, the USA is the research leader, with huge funding and research output on the Arctic. In fact, all the littoral states—Canada, Denmark, Russia, Norway, Iceland, Sweden, Finland and the US—have research stations in close proximity to the Arctic. While Canada has the Polar Environment Atmospheric Research Laboratory near Eureka, Nunavut and many others, it is also setting up a High Arctic Research Station in Cambridge Bay.This will be a multi-disciplinary facility delving into environmental and research development issues.[59] Denmark has the Danish Polar Center in

[59] Iselin Stensdal, 'Harder, Better, Faster, Stronger', Asian Arctic Research 2005"2012, Fridtjof Nansen Institute, Oslo: May 2013. See, http://www.asiarctic.no/images/artikler/publications/publ/Stensdal_2013_Asian_%20Arctic_Research.pdf. P. 3

Greenland, and Sweden has stations in Abisko and Tarfala, as well as radar facilities in Kiruna.[60] Finland has its Arctic Centre at the University of Lapland in Rovaniemi. The US Arctic Research Commission has offices both in Washington D.C. and Anchorage, Alaska, and Russia's research station is at the Barentsburg on the Svalvard island, Norway.[61] The International Arctic Research Centre at the University of Alaska, Fairbanks is a cooperative research institute funded by the US and Japanese governments.[62]

The four non-littoral Asian states all have research stations at Ny-Alesund in the Svalbard Island. Norway established Ny-Alesund as the international base for research in natural sciences. Along with Norway, Germany, UK, Italy, France and Netherland have research stations. Svalbard is the world's most northern place equipped with modern infrastructure and research facilities. It is regarded as a treasure trove for scientists studying in detail the complex atmosphere.

The Arctic research of Asian countries is primarily Climate Change-related. Research activities and output has significantly increased in the last five years, with the government of these Asian states investing in Arctic research by establishing research funds and large collaborations in research projects.

Research Footprint of Asian Countries

China

China, which has shown a great deal of policy push towards the Arctic in recent years, had its first interface with the Arctic region in 1951 when a scientific team set sail to the North Pole and conducted surveys.[63] A few decades later, in 1984, China led its first expedition to the Antarctic and, in the following year, set up a research facility called the Great

[60] Iselin Stensdal, ibid. p.3

[61] Iselin Stensdal, ibid. p.3

[62] Ibid. p.3

[63] Iselin Stensdal, ibid. p.5-6

Wall.[64] By the mid-nineties and onwards, China started focusing exclusively on the Arctic, and by 2003, it had set up a permanent research station in Ny-Alesund called the Yellow River.[65] China's Polar research is within the Ministry of Land and Resources. Over the years, there has been an increased effort to raise public awareness and knowledge of polar issues. This awareness has expanded to various ministries and scientific bodies, including the Ministry of Foreign Affairs, the Ministry of Industry and Information Technology, the Chinese Academy of Social Sciences, the Chinese Academy of Engineering, China Meteorological Administration, the National Natural Science Foundation, the National Mapping Geographic Information Bureau, and the Resources, Environment and Technology Bureau.[66] There is a clear thrust towards studying the Arctic from an environmental and Climate Change perspective as well as observing the larger politics in the region. China's research focus in the Arctic relates to the rapid changes in the sea ice, suggesting its interest in navigation and the northern passage sea route. Many of its research studies also look at how the Arctic Oscillation will affect the East Asian winter climate.

China is also carefully observing the Arctic changes from the legal perspective (UNCLOS) as well. To recall, China ratified the 1982 UNCLOS on June 7, 1996, and made an observation to the ratification on August 25, 2006.[67] There is no doubt that China wants to increase its activity in the Arctic, and one pointer to this is its building a second ice-breaker research vessel. China plans to build domestically its second ice breaker, which is planned to go into operation in 2014, and will join its first ice breaker vessel *The Xuelong* for polar expeditions.[68]

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64 Iselin Stendsal, ibid. p.5-6

65 Ibid. p.5-6

66 A.M. Brady, 'China's Rise in Antarctica', *Asian Survey*, 50(4), p.765.

67 Read Chinese statement after the ratification in 1996, and the observation to the ratification in 2006. See, http://www.un.org/depts/los/convention_agreements/convention_declarations.htm#China Upon ratification

68 'China's second icebreaker enter detail design phase', Xinhua, October 22, 2012, See, http://news.xinhuanet.com/english/china/2012-10/22/c_123855749.htm

Japan

Amongst all the Asian countries, Japan has the longest experience in polar research. Its Arctic connection goes back more than a century, with its first expedition taking place between 1910-1912. Japan was also one of the 12 original signatories to the Antarctic Treaty in 1959. Like many of the Asian countries, its focus and interest has essentially been on scientific research and surveys. But, amongst Asian countries, Japan is the most integrated with the Arctic 5 scientific community, particularly the USA.[69] Japan's key coordinating agency is the National Institute of Polar Research (NIPR), established in 1973, which comes under the Ministry of Education, Culture, Sports, Science and Technology (MEXT). The NIPR manages the research stations in the Antarctica and in Svalbard.[70] The scientific study is primarily focused on atmospheric science, geoscience, meteorology and glaciology. In 1990, the Arctic Environment Research Center (AERC) was established within the NIPR. Since 2004, the AERC's main role is to manage the Ny-Alesund research station, and to facilitate research activities.[71] The AERC collects and stores data, and has set up a homepage for wider access to the research.[72] It also publishes the annual Arctic Research Directory.[73]

Japan's polar thrust is to facilitate holistic and interdisciplinary research for wider public benefit. Japan's National University Corporation Act lays great emphasis on scientific advancement as well as scientific international cooperation, and has organized its education system to encourage scientific learning. Further, there is the Japan Consortium for Arctic Environmental Research (JCAR), a network of about 300 Japanese scientists focused on the Arctic.

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[69] Iselin Stensdal, 'Harder, Better, Faster, Stronger', Asian Arctic Research 2005-2012, Oslo: Fridtjof Nansen Institute, May 2013. See, http://www.asiarctic.no/images/artikler/publications/publ/Stensdal_2013_Asian_%20Arctic_Research.pdf. p.17

[70] See, http://polaris.nipr.ac.jp/~aurora/

[71] See, http://www.nipr.ac.jp/english/polar-research02.html

[72] See, http://www.nipr.ac.jp/aerc/e/index.html. Accessed on January 21, 2013

[73] See, http://www-arctic.nipr.ac.jp/directory/web_D2011/2011E/2011E_top.htm. Accessed on January 21, 2013

At its research base in Ny-Alesund, Japanese scientists carry research on radiation and greenhouse gases, vegetation and soil-micro biology. Japan also has a station in Iceland to observe the aurora phenomena. Ice cores from Greenland are examined to study environmental changes of the past, and the data obtained from the Arctic are compared and contrasted with the findings from Antarctica.

Japan has been active in Savalbard since 1990, and was the first amongst Asian countries to set up an Arctic research station in 1991.[74] Interestingly, it was also one of the first countries to have a station in Antarctic in 1957. It must be noted that Svalbard is not the only research destination for Japan: it has a much expanded activity in the Arctic, with research locations in Iceland, Greenland, and in northern Scandinavia. A large percentage of Japan's Arctic research is conducted at sea, and thus, it has invested in several sea vessels.

To sum up, Japan has a solid Arctic research foundation. Polar research is situated within a larger domestic R&D thrust, aimed at scientific advancement, and promoting Japan's future development.

South Korea

Korea's polar research is not of long standing; but it has, nevertheless, come of age in a short span of time. In 1986, it signed the Antarctic Treaty System, and set up a permanent station in 1988. In 2011, Korea celebrated the 25th anniversary of its endeavours in the Antarctic. As for its Arctic ventures, the Korean Arctic Science Council (KASCO) was set up in 2001 to specifically focus on research on the North Pole and, in 2002, it opened a station in Ny-Alesund.[75] With the Arctic increasingly coming on the radar, the Korean National Committee on Polar Research (KONPOR) was established, and in 2009, a research ice-breaker *Araon* was commissioned to carry out an expedition to the Arctic.

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[74] Iselin Stensdal, 'Harder, Better, Faster, Stronger', Asian Arctic Research 2005-2012, Oslo: Fridtjof Nansen Institute, May 2013. See, http://www.asiarctic.no/images/artikler/publications/publ/Stensdal_2013_Asian_%20Arctic_Research.pdf. p.18

[75] Iselin Stensdal, 'Harder, Better, Faster, Stronger', Asian Arctic Research 2005"2012, Oslo: Fridtjof Nansen Institute, May 2013. See, http://www.asiarctic.no/images/artikler/publications/publ/Stensdal_2013_Asian_%20Arctic_Research.pdf. P. 24

Korea's interest is similar to that of the other Asian countries, with its primary focus being on scientific research, surveys, and long term observations about the polar regions with the aim of contributing to the efficacy of Korean policies by generating independent and reliable information. Korea's Polar Research Institute (KOPRI) is building up its research activities, and encouraging young doctoral students to study topics in the natural sciences.[76] It is not surprising that the Korean government is increasing the supply of funds (about US $3.3 billion) by 2020 to marine and polar technology development, with an emphasis on research on both the Arctic and the Antarctic. This is in accordance with its 2011 "Marine Technology Road Map".[77] Some of the latest developments in the scientific study of Arctic by Korea include the setting up of the government-aided Korea Maritime Institute of Science and Technology (KIOST) in 2012, a successor to the Korea Ocean Research and Development Institute set up in 1973.[78] In the field study of marine science, KIOST is probably Korea's only government-run research institute on marine science technology and marine resources. It is expected that this government initiative and interest will help shape a public-private partnership, and drive marine industry and polar research to new levels of understanding that would include making the coastal cities of Busan and Incheon as hubs for ocean and polar research and industry.

Like the other Asian countries discussed, Korea's Arctic research, which began in 2000, is primarily to understand global Climate Change. In the short period of a decade, Korea has made considerable progress in building Arctic knowledge and capabilities, and will be an important actor in the Arctic, both from a scientific perspective as well as in terms of political considerations.

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[76] See KOPRI Annual Report, 2011. http://www.kopri.re.kr/www/about/kopri_brochure/annual_report_2011.pdf. Accessed on February 2, 2013

[77] Ibid.

[78] See, http://beta.pemsea.org/organization/kordi

India

India's Arctic endeavours are very recent, and amongst the Asian countries—China, Japan and South Korea—it is the last to begin engaging in Arctic research. However, India is no stranger to polar research. India's Antarctic enthusiasm started in 1981, and by 1983, it had set up a permanent research station. The Arctic is of special value to Indian research as a number of studies have indicated that there are connections between the Arctic region and the intensity levels of the Indian monsoon.[79] With research stations at both poles, India has an advantage in data collection and comparison. Being a developing country with a high level of vulnerability to the impact of Climate Change, India is committed to understanding the scientific processes behind Climate Change, and this forms a core component of Indian research. Moreover, India's management of the Himalaya requires a comprehensive study of glaciology, and the study of the Arctic helps in a better understanding of this.

The National Centre for Antarctic and Ocean Research (NCAOR) is an autonomous agency under the Ministry of Earth Sciences (MoES) (earlier called the Department of Ocean Development) and was established in 1981.[80] It coordinates and implements the polar research in the Antarctic and the Arctic.

Over the years, the NCAOR has grown, both in its core staff and its research activities. The centre was important in facilitating India's 2010 submission of claims of extended continental shelf to the UN.[81] Further, NCAOR administers and maintains India's oceanic research vessel *Sagar Kanya*. Plans are now afoot to build an exclusive polar research vessel. The NCAOR works along with the Ministry of Science & Technology as well as the Legal and Treaty Division of the Ministry of External Affairs. Interestingly, the roots of the Indian missions to the Antarctic

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79 S. Nayak, 'Polar Research in India', *Indian Journal of Marine Sciences*, 37(4), pp. 356-357

80 See, http://www.ncaor.gov.in/

81 Ibid

actually lie in the joint ISRO-Hydrometeorological Centre of Russia agreement. The noted scientist Paramjit Singh Sehra joined the 17th Soviet Antarctic Expedition of 1971-73.

The 'Antarctic Expedition and Polar Science' is listed under the programmes of MoES, and by virtue of its contribution to Antarctic science and its presence in the Antarctica, India was accorded consultative status in the Antarctica Treaty System.[82] India is simultaneously a member of the Scientific Committee on Antarctic Research (SCAR), Committee of Managers of National Antarctic Programme and Standing Committee on Antarctic Logistics. It is also a party on the Convention on Conservation of Antarctic Marine Living Resources, and is the founder member of the Asian Forum for Polar Sciences which is active in Antarctica and Arctic. The scientific activities of India, which started on a modest scale, have evolved into a comprehensive programme. India set up its first polar research station in 1983 called Dakshin Gangotri. The second station Maitri was set up in 1989, and a third station named Bharati is being planned. In the Arctic, the Himadri research station in Spitzbergen Island in Svalbard was set up in 2008. In the Arctic, the following studies are being undertaken: Atmospheric Sciences, Earth Sciences/Palaeoclimate, Glaceology/Geology and Biological Studies.[83]

Since the Himadri station opened in 2008, there has been growing attention to studying Arctic policy and governance. The geopolitical dimension and India's role in the region is increasingly being discussed, particularly as India has applied for an Observer position in the Arctic Council. Since 2007, India has sent expeditions twice a year, and in June 2010, the Indian Minister of Earth Sciences visited the research station at Svalbard.

The Arctic is also being discussed in New Delhi's policy circles both in terms of awareness and understanding as well as in terms of the

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[82] See, http://dod.nic.in/antarc1.html

[83] Iselin Stensdal, 'Harder, Better, Faster, Stronger', Asian Arctic Research 2005-2012, Oslo: Fridtjof Nansen Institute, May 2013. See, http://www.asiarctic.no/images/artikler/publications/publ/Stensdal_2013_Asian_%20Arctic_Research.pdf. P. 13

emerging dynamics of geopolitics. In February 2011, an Indo-Norwegian meeting titled 'Pole to Pole' was organised by the MoES and the Norwegian Embassy, in collaboration with the NCAOR, Goa, and the Norwegian Polar Institute, Tromso**.** The idea was to get insights into the effects of Climate Change in the polar regions. Interestingly, India and Norway are the nearest neighbours in the joint polar research being undertaken in Antarctica and in Svalbard. An IDSA research team visited the Barents region in June 2012 as part of the institute's cooperation with PRIO, and in September 2012 the Association of Indian Diplomats held a discussion on 'Arctic and India' at the Indian Council of World Affairs (ICWA) where the participants included retired diplomats and strategic experts. Further, IDSA-PRIO organised a workshop in November 2012 on 'Governance and Resource Use: The Case of the Arctic', and invited officials from the Barents Secretariat, the Norwegian Defence Ministry and research experts from the Fritzof Nansen Institute in Olso. Some of the questions discussed were as follows:

1. Should India be content with its research engagement, and ensure the region remains 'a pole of knowledge and science'?
2. Should India evolve a resource strategy in the Arctic?
3. What initiatives should India undertake to develop human and material infrastructure in the unfolding of the Arctic dynamics?

Though India's Arctic footprint is smaller as compared to the other Asian countries, it is drawing scientific attention around its work in the atmospheric, marine, and glaciological sciences. Also, in Indian policy circles, an interest on resource governance issues is gaining ascendancy.

From the discussion above, it can be noted that the Asian countries have a common concern about the global impact of Climate Change, and are giving priority to Arctic research efforts. All the Asian countries discussed have, in recent years, taken significant steps to increase investment and resources in the Arctic—whether it is China setting up the Arctic research fund in 2006, or India opening its research station in Svalbard in 2008.

The Svalbard archipelago is a key place for Arctic research. Since India also set up Himadri in 2008, all the countries now have permanent

research structures in the Arctic. The Asian countries have stations at both poles, which can be an advantage with regard to gathering data for comparison purposes.

Some of India's major research objectives in the Arctic region are:[84]

- To analyse 'hypothesized tele-connections' between the Arctic climate and the Indian monsoon
- To study the characteristic changes in the sea ice in the Arctic due to warming
- To study and examine Arctic glaciers and effect on sea-level rise
- To comprehensively study changes in the flora and fauna under the impact of warming and anthropogenic activities in the Arctic region

Scientific investigation and research in the Arctic occupies high priority in India. In 2012, India was elected to the Council of the International Arctic Science Committee (IASC). A sum of US $12 million has been committed by the government for Arctic research in the next 5 years.[85] Currently, India is maintaining its Arctic policy as being research-oriented and scientific, unlike some other Asian countries (like China and Korea) which have openly expressed their commercial interest in the region. However, at some stage, realpolitik imperatives could push India to join hands with one of the A5 countries (Canada, Denmark, Norway, Russia and Denmark) to explore the opportunities of hydrocarbons explorations in the Arctic.

India and the Arctic

In the backdrop of rapid changes—geophysical, geopolitical and geoeconomic—what would/should be India's interest and role in the Arctic? As mentioned, India has had a long scientific association with

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[84] See Ministry of External Affairs, Government of India website for details: http://www.mea.gov.in/in-focus-article.htm?21812/India+and+the+Arctic

[85] Ibid.

the Arctic region. While the Arctic might seem to be outside the scope of India's strategic radar, contemporary developments in the region present an opportunity to articulate ecological protection, particularly promoting sustainable use of resource and conservation in the Arctic region. As described earlier, India is among the 10 countries that have a research centre (Himadri) in the Svalbard islands for studying the effects of warming and the melting of ice. Now that it has an Observer Status in the Arctic Council, India should promote a sustainable development framework (curbing over-exploitation), and bringing resource management into the global governance debate.

Being in the laboratory for studying and monitoring the Arctic is important for India. Scientific evidence is important for framing Climate policies, and forms an important part of India's Climate diplomacy. India may be physically far from the Arctic region; but the impact of the melting ice on global weather system makes it vulnerable to Arctic changes, and thus, these need to be carefully understood and studied further. For example, questions that need further scientific investigation are: What will be the impact of the release of vast amounts of methane gas when the Arctic ice melts? What will be the impact of such a release on the stability of the monsoon system on which billions depend in South and South-east Asia?

The Arctic today has is in an antithetical situation where, on the one hand, there are strong and important economic interests, and on the other, a need for climate protection and resource governance. In both cases, there is need for further research and findings, data collection, and clearer information to strengthen both adaptation and mitigation policies in India.

Of late, some policies have been initiated that go beyond the scientific realm to a larger politico-strategic-economic orientation. On November 6, 2012, India formally submitted its application to Sweden for Observer Status in the Arctic Council, which was approved in May 2013. Though power-packed with Canada, Denmark (Greenland), Norway, Russia and the USA, the Council is non-controversial and benign in its functioning. It refrains from dealing with sovereignty and security issues. Because the Council functions as a fact-finding, capacity advancement, and an information clearing house, it gives good reasons for non-Arctic states to become Observers. However, India would

need to strategize its role beyond the Observer position. Merely being on the high table should not be the primary goal, or a thoughtless reaction to the fact that China has also applied. In order to be purposeful, India should consider the Council and its Observer Status in it as a platform in which it can articulate—along with the big global players—broader multilateral cooperation, and bring resource use and sustainability to the forefront. Global governance issues, especially sustainability and access to resources, will strongly define the future, and will create differing views. India should be actively involved in dealing with them.

The Arctic Council can only gain strength from a wider membership and its participation, and evolve a mechanism towards effective resource governance. Strategies to improve prevention and preparedness in the region will also be crucial. Several countries, including China, Japan and Singapore, are now Observers in the Arctic Council. Clearly, the changes in the Arctic have environmental, economic and geopolitical dimensions, and India cannot be immune to some of the consequences.

In the context of the unfolding dynamics in the Arctic, India's strategy should work around three aspects: environmental, resources, and routes (ERR). The strategy for India should be to incorporate these aspects, and prioritise them based on knowledge and information, and not be impetuous. From an environmental/scientific understanding point of view, India should continue its engagements in the Arctic. Clearly, the impact of global warming has had a severe effect in the region, and the challenge now is to build institutional structures that can steer society away from critical tipping points and ensure sustainable livelihood for all. Only scientific truth can help achieve this, and act as a catalyst to improve institutions and decision-making mechanisms, and even become the basis for a proposal for a Sustainable Development Council in the United Nations. The climate mechanism in the Arctic is not settled, and knowledge of its causes and effects is far from complete. India has a very strong position in the global Climate Change debate, and the ice-melt in the Arctic reinforces India's argument of the Western world being the emissions culprit. It also believes in the reduction of global emissions based on common but differentiated responsibilities and capabilities. On the resource front, particularly in oil and gas, there has been much excitement based on estimates by the influential US

Geological Survey that said that the oil and gas deposits in the Arctic could be between 20–25 per cent of the world's undiscovered reserves. But these are only approximations. The oil and gas resources are limited on the shelf, and exist in inhospitable environments beyond the countries EEZ. It will require huge investment to extract them, and be accompanied by high environmental costs. For example, Gazprom and Rosneft are not showing much interest in exploring the Eastern Siberian and Chukotka seas. The Royal Dutch Shell in March 2013 announced that it is temporarily curtailing all drilling operations in the Arctic after its two ships suffered serious damages in the Beaufort and Chukchi Seas.[86] India's resource diplomacy should be geared towards on-land mineral exploration and economic participation in the Arctic region particularly the Barents.[87] As the ice-free period along the Arctic Northern Sea Route increases, sea port development will also pick pace. Port building, in the region, will require skilled manpower which India can provide. In fact, this element can be a strong aspect of bilateral relations with Norway and Russia.

Both the shipping routes, the Northern Sea Route and the Northwest Passage, offer exciting prospects. The Arctic Ocean's coastline belongs mostly to Russia and Canada, and each claims the sea-routes as 'internal waters'— which means that ships need their permission to pass through the waters. The USA, however, insists that both the routes are 'international straits'. Shipping through the Northern Sea Route, as compared to the Suez Canal route, is calculated to cut down the distance by almost 2800 nautical miles, or 22 per cent (between Rotterdam and Shanghai)—a cost saving of over 30-40 per cent. The shortening of the route has greatly interested China, and will also interest South Korea and Japan, who would be particularly keen to develop an Arctic policy.

However, it would be fair to say that, for India, that the new sea route is not beneficial; in fact, it is quite insignificant. India's naval strategy

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[86] *The New York Times*, February 27, 2013. http://www.nytimes.com/2013/02/28/business/energy-environment/shell-suspends-arctic-drilling-for-2013.html?_r=0

[87] Vijay Sakhuja, 'The Arctic Council: Is There a Case for India?' ICWA Policy Briefs, New Dehli: Indian Council of World Affiars, 2010, p. 5.

should be anchored in the Indian Ocean Region; it should work towards establishing itself as the resident maritime power, and thwart strategies that polarise the IOR. In fact, the sea routes shift through the Arctic will not greatly diminish the traditional Europe-Asia route. With the USA rebalancing its global engagement, the focus on the 'Indo-Pacific' that integrates the Indian Ocean and the Pacific Ocean into a single region will be far more significant.

Following from the above strategic evaluation, India's Arctic policy is as follows: first, it should primarily focus on advancing scientific research in the Arctic and, simultaneously, build strong bilateral cooperation with the 'northern' countries like Norway and Russia. The principle partner in scientific endeavour will continue to be Norway, and on the economic front, Russia. The Ministry of External Affairs should consider setting a 'North' Europe desk focusing on the Arctic, and should facilitate studies of political developments in the region. India does not have the resources to venture in a big way in the Arctic; but, can think about ideas that can help in Arctic development: for example, supporting efforts to make the Arctic a nuclear weapon free zone for the sake of humanity. As is already known, a seabed treaty forbids the stationing of nuclear weapons on the Arctic ocean ûoor. India should also advocate sustainable resource development and ecological protection—issues which the A5 states are trying to work at cooperatively. After all, the A5 have also acceded to the Antarctic Treaty of 1959 that makes Antarctica a Nuclear Weapon Free Zone and a military free zone. The Arctic, however, lacks a compact environmental protection regime. It is a collection of customary international law and varied bilateral and multilateral instruments, with no unifying connector. India can act as the unifying connector, and help bring together a robust regime. This will require connecting science to policy, and policy to people. With a toe-hold in the region, India can then gradually scale-up its capabilities.

With ice cover at a record low, and exploration at an all time high, the Arctic presents a paradox: the exploitation of the melting sea ice to drill for more oil at the same time as burning oil caused the melting in the first place. It is, indeed, tempting to seek an energy future in the Arctic; but, it is equally a responsibility to strongly support the conservation, management and governance of Arctic resources. The

structures and laws are in place as reflected in UNCLOS, IMO, and other environmental and fisheries agreements. However, correct policies also need to be framed.

Current Development in the Arctic

As the Arctic ice sheet thins and grimly disappears, the oil reserves, mineral deposits, and the shipping lanes that have resultantly emerged, have started appearing attractive to states. Thus, it is not surprising that many compasses are pointing north. In the midst of the race for resources, and the irresistable urge to drill, the Arctic Council will have to broker norms and agreements to protect the ecologically sensitive areas, to continue further research on the impact of Climate Change, and the governance of new shipping routes. Already, the Council has, in May 2013, adopted a legally binding agreement to alert other members as regards oil spills, and the sharing of responsibility for the clean ups. Pressures from civil society and environmental groups like Greenpeace will increase to take radical steps to protect the Arctic.

The Arctic Council will also be tested—both in terms of managing the contestation that will arise amongst the Arctic members as well as the expanded Observer Status members that now include Asian countries whose interests lie more in economics and trade. It must be said that the Council has successfully brought nations that are historical rivals—like the USA and Russia—to work together. With a strong climate connect, the environment can be a key driver towards cooperation. Issues beyond energy resources are equally important and, as the northern passage opens up, aspects relating to the climate monitoring system, port development, and search and rescue operations will enagage the Council.[88] The Arctic fisheries are also vital, and the USA is pushing for the Council to determine how high seas fisheries will be managed, and where commercial fishing may or may not be permissible.[89]

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[88] Sara Reardon, 'China gains Observer Status', *New Scientist*, 17 May, 2013. See, http://www.newscientist.com/article/dn23553-china-gains-observer-status-on-the-arctic-council.html#.UeOVJjvIzzg

[89] Ibid.

Conclusion

In the 21st century, the Arctic will remain high on the international radar, and keep countries, particularly those within the rim and some beyond, honest in their engagement. Inevitably, competition and cooperation will emerge, along with positioning and posturing.

Three reasons for increasing attention on the Arctic can be highlighted. First, the Arctic will continue to remain a large geo-strategic tract. Whether it is new resource finds or new emerging transport routes, the Arctic's strategic value will only amplify. Political tension and high politics will always be lurking around it, in spite of the fact that, so far, tension has remained low in the region. The race for resources, as history has shown, leads to geopolitical competition and contestation, while the opening of new transportation routes tend to foster new cooperation. Interestingly, Beijing has already started articulating a 'commons' position—that is, no nation has sovereignty over the Arctic, and that all resources there are for all to exploit and use. This is a clever spin, and a clear expression of China's interest in the Arctic.

However, the five Arctic littoral states—Norway, USA, Canada, Denmark and Russia—would quite clearly not agree to such views. The Arctic's political temperature may heat up in different ways, in spite of the fact that Russia and Norway have agreed and ratified the delimitation line in July 2011 after 40 years of negotiation. The immediate reason for things heating up could be the discussion about 'who' shall extract the oil when the ice thins and possibly disappears. Or, 'How' will the new marine delimitation lines be drawn? 'Who' will control the new sea passage? And maybe, at some stage, the bigger question about 'who' owns the Arctic will be raised?

In a sense, one can question the robustness of institutional regimes in the Arctic. Russia and Norway might be an exception and, therefore, the issue of conflicting continental shelf claims, and the possibility of tension arising from such claims, cannot be discounted. Also, the difference of opinion between the USA and Canada on the issue of

international waters and internal waters will be irksome. Russia, one can argue, will be a key player in the Arctic. The international system is essentially about maintaining peace through balancing power. The balance of power is almost indispensable in diplomacy, and one of the greatest exponents of this has been Russia. With reference to the Arctic, where 'great power' politics will be potentially high and competition over future stewardship may lead to stand-offs, Russia will be a critical player and a counterweight to any balance of power tilting westwards. It might also be a possibility that a resurgent Russia will find the Arctic region a perfect ground to proclaim its power status. Also, interestingly, the odd country out in the A5 is Russia. The other A4 are NATO members, with long standing Western liberal democracies, and thus are natural allies. Yet, Russia seems to be in a position to balance the unfavourable equation. It has greater cooperation with Norway, with which it shares border, over fishing and hydro-electricity, and with Canada it cooperates on ice breakers.

Sino-Russian relations, and possible changes in Russia's foreign policy orientation due to the rise of China, will also be important for understanding the wider strategic framework in the Arctic. If Moscow decides to build closer ties with the West as a result of China's rise, this would counterbalance China's interest in the Arctic. If, on the other hand, Beijing invests in a closer relationship with Moscow, then this could advance Chinese engagement in the Arctic, posing security challenges for Norwegian interests in the region.

Secondly, it must be remembered that the Arctic is a semi-enclosed ocean surrounded by land, and like all high seas, is governed by the laws of the sea (UNCLOS). The Antarctic, a geographical contrast, is a landmass surrounded by an ocean. Further, the Arctic is under the territorial proprietorship of the A5 nations. Unlike the Antarctic, which is governed by the 1959 Treaty that bans territorial claims, the Arctic region is sectoral. The only legal framework governing the Arctic before the 1982 UNCLOS were the national laws of the Arctic countries, and the 1920 Paris Treaty on the Status of Spitsbergen (Svalbard Treaty).

In 1982, the Soviet Union signed the UNCLOS, which gives the coastal states exclusive rights to develop natural resources in a 200-nautical mile zone extending from the border of their territorial waters (12

miles from the coast). So, clearly there are norms and regulations. However, differences may emerge on the interpretation of the existing laws because of the geo-physical changes in the Arctic. The UNCLOS, the most important governance structure, has established principles, particularly on the limits over national jurisdiction. When UNCLOS was being drafted, the Arctic ice melt was not factored in; yet, the Convention is flexible enough to allow for new physical changes and developments as defined in Article 234 Section 8 on 'Ice-covered areas'. UNCLOS will remain the bedrock for settling future claims in the Arctic. All Arctic states, with the exception of the USA, are parties to UNCLOS, and all—including the US agreethat the legal regime contained in the UNCLOS applies to the Arctic as well. Obama's administration may take up the ratification of the UNCLOS as the USA eyes the Arctic resources.

The role of the Asian states, in particular China and its position over the interpretation of UNCLOS, will likely impact the governance structure in the Arctic. China ratified the convention in 1996, but hesitates–as for example in the case of Spratly islands and Scarborough—to bring it under a dispute settlement mechanism. The Chinese claim to these islands is based on historical records, whereas UNCLOS requires countries to surrender such claims and abide by either the 'territorial waters' (waters under the jurisdiction of the state, traditionally 3 miles) or EEZ (exclusive economic zone having a 200-nautical mile limit). So, while laws exist, they regularly clash with sovereignty. The Arctic, too, may witness claims and counter-claims before being settled.

With the Arctic meltdown, new shipping routes will open up. The rights of states for various types of passage (innocent, transit, archipelagic, or free passage) are already set out in UNCLOS. The practical modalities and implementations have to be worked out, which could mostly be bilateral, but would need to be applied uniformly to other states as well. As for resource finds, the landmass underneath Arctic is almost entirely the continental margins of the five Arctic states. Of these, Russia and Norway have already made their submissions to the Commission on the Limits of the Continental Shelf, and received recommendations for delineation of the outer limits. Canada and Denmark are expected to make their submissions in 2013.

Thirdly, there is the question of resource finds. The Arctic, as surveys have indicated,holds the largest remaining untapped gas reserves and some of its largest undeveloped oil reserves, making it the final frontier for energy development. There is considerable hype that the Arctic's oil and gas finds will take care of the world's energy needs. It is often forgotten that many known reserves are not exploited because of their inaccessibility—short productive period and low temperatures. Any oil and gas development will require building massive infrastructure through areas that are ecologically sensitive. The other resource attention in the Arctic is its vast mineral wealth. The Arctic region of Russia is probably the most developed, and has vast deposits of nickel, copper, coal, gold, uranium, tungsten, and diamonds.

For Russia, the Arctic is a strategic resource base which includes the rich Shtokman field, located 550 km from Murmansk. Known reserves of natural gas are among the largest in the world with estimates of 3.8 trillion cubic meters.[90] Much of Russia's gas production already comes from the Arctic areas of the Yamal Peninsula and the northern part of the Arkhangelsk region. But these resources are not leverage. Russia would need Western technology and heavy investment to develop these fields before it can sell it to the markets in Europe and North America. This clearly outlines the need for the cooperation and integration of the energy sector, with Russia and the West coming together. At this stage, given the various physical difficulties and the global economic downturn, the extraction of oil and gas will be low key, thus making the Arctic more an active shipping route rather than an oil and gas production zone.

Final Thoughts

The great ripples that have accompanied the unprecedented changes in the Arctic due to Climate Change have now become a force that has triggered responses and made policymakers sit up. The Arctic, as described in this monograph, is viewed through the politico-security

[90] See, http://www.shtokman.ru/en/project/gasfield/

prism. The geopolitical landscape marked by Asia's geoeconomic ascendancy cannot be ignored—after all India and China have huge economic and ecological footprint.

The climate change impact in the Arctic is far greater than any other part of the world. The resultant geophysical changes, as studies increasingly indicate, have global ramifications in terms of weather pattern and ocean current changes. On the other hand, the dramatic loss of sea ice has led to increased economic activities in the form of oil and gas development, commercial shipping and fishing. The challenge is to ensure that the new economic access that has come about because of global warming does not further destabilise the Arctic. Promoting ecosystem-based management and resource governance should now be a global agenda. Continued scientific investigation about the snow, water, ice and the permafrost changes in the Arctic will be crucial for countries to have resilient climate change policies.

In an interconnected world with interlinked issues, understanding Climate Change and the Arctic and exploring the intersection between the two is extremely important. The Arctic region is a vast area around the North Pole, covering over 1/6th of the earth's landmass. With the melting of the ice, the attraction for resource exploitation and benefits of sea routes is changing the Arctic profile. The environmental, commercial and the strategic forces are all set to play a critical role in the Arctic.The lines of a poem "Puzzle" by Synovve Haga beautifully capture the changes in the Arctic:

Many pieces must fall into place
In the Great Puzzle
Some do so willingly
While others pave their own paths
Ignoring the pattern
Be patient
They all find their way in the end
And settle down
Where they belong (*Svalbard – With roots in the Permafrost*)

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