EDITOR'S NOTE

For the second year running, the lead article in the Winter edition of the *Journal* incorporates the thoughts of the Chief of the Air Staff. It is appropriate that an air power journal should periodically publish the views of the air chief. The contribution is a 'must read'.

As we come to the end of a rather eventful year, there are two significant issues that will remain matters of continued concern. The first is the birth and rise of the 'Islamic State'. It is becoming increasingly more powerful and relevant and this is a black mark on the international community at large. The question that must be asked is: why was it not nipped in the bud? Unfortunately, no valid answers are forthcoming. What is worse is that, apparently, there is no discernible concerted plan of action to counter the menace. Air power has been effectively employed but it cannot put an end to the rebel movement. Also, though air power effectiveness is a function of numbers, even more importantly, it depends on the nature and accuracy of intelligence information. That will always be difficult to come by in hostile territory. There is a silver lining in the fact that although the Islamic State controls a fair amount of real estate and even calls itself a state, no country has so far recognised it as such. Therefore, it should be possible to adopt a coordinated plan to end the menace. Unfortunately, all the players ostensibly fighting the Islamic State appear to have overpowering agendas of their own. As a result, every nation engaged in offering a challenge to the Islamic State is playing a double game, at the least; some have even three or four competing interests. It is difficult to understand as to how the international community has been unable to ensure that the Islamic State is unable to sell oil even when offered at considerable discount. Short-term gains could easily boomerang in the mid to long-term. Again, it is more than conceivable that the oil is being sold to those that have also taken up arms against the rebels. In any case, it is difficult to understand why steps have not been taken to ensure that the rebel ranks are not buttressed from outside

the region. All in all, the Middle East region is in tremendous flux and it is difficult to predict when some measure of stability will return. The impact of the upheaval is bound to be felt far and wide and for some time to come.

The second issue worthy of mention is the ongoing debate on India's nuclear doctrine. The debate started in India and has been taken up abroad as well. This writer is in favour of leaving the doctrine unchanged but the issues raised by the detractors merit a response. Greater clarity is warranted on three issues. It is opined by some that our adopting the No First Use (NFU) philosophy should be discontinued; the presence of Tactical Nuclear Weapons (TNW) with Pakistan must be addressed afresh; and the promised response should be altered from 'massive retaliation' to 'punitive retaliation'. In essence, the essential difference is in the perceived purpose of our nuclear weapons. Are nuclear weapons meant to deter use of such weapons or should we plan on their use in war-fighting? If they are intended as a deterrent, the NFU philosophy commends itself. Also, massive retaliation emphasises the intention to deter as opposed to the somewhat watered down term 'punitive response'. Punitive response could also imply willingness to fight a nuclear war. That must never be our intention. A nuclear bomb is not just another weapon that could be used in a war. What is needed is that our credibility of a second strike is maintained and this is signalled in no uncertain terms to our possible adversaries. As regards TNW, a nuclear weapon is a strategic weapon and the term is a *non sequitur*. In fact, one aspect of TNWs is indeed dangerous as the authority for release of the weapon would have to be decentralised to a level where the complete picture may not be discernible and serious mistakes can occur. Thus, we will do well to leave our doctrine unchanged.

There are a number of aspects that impinge on our national security; the different contributions in this *Journal* cover extensive ground and each article is worthy of the attention of the reader.

Happy reading.

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Vol. 9 No. 4, Winter 2014 (October-December)

CHALLENGES OF AIR POWER

ARUP RAHA

INTRODUCTION

I would like to thank the Director General, Centre for Air Power Studies (CAPS), for providing me the opportunity to be amongst such fine proponents of aerospace power, and share my thoughts on a subject which remains at the forefront of all academic dialogue on air power. The subject "Challenges of Air Power" is indeed intriguing, since air operations have, within a short period of 110 years, evolved to an extent that no modern military operations are imaginable without application of air power, and peace-time operations become difficult to execute without this vital component. Over the last 82 years, the Indian Air Force (IAF) too, has taken shape and evolved into one of the finest air forces of the world, something that would not have been possible without the exemplary leadership of our first Indian Air Chief, Air Marshal Subroto Mukerjee.

REMEMBERING A LEGEND

For the Indian Air Force, April 1, 1954, was a memorable day. Exactly 21 years after the raising of its first flight, one of its founder members, Air Marshal Subroto Mukerjee OBE, took over as the commander-in-chief of the Indian Air Force. On the same day, the president awarded the Presidential Colours

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Air Chief Marshal **Arup Raha** PVSM, AVSM, VM, ADC, is the Chief of the Air Staff, Indian Air Force.

This speech was delivered as the Inaugural Address at the Subroto Mukerjee Seminar on November 11, 2014, organised by the Centre for Air Power Studies, New Delhi.

to our air force. The immediate task of restructuring and reequipping the IAF with newer aircraft and equipment fell upon Air Marshal Mukerjee. During his tenure, the Indian Air Force inducted a variety of state-of-the-art aircraft like the Dassault Mystere, Hawker Hunter, Canberra and the legendary Gnat. He laid great emphasis on planning and development of human resources, a legacy that continues since then. It was his vision and foresight which has indeed placed the IAF where it is today.

SECURITY CHALLENGES AND SPECTRUM OF CONFLICT

Before I talk about the subject *per se*, I would like to share some views on how aerospace power has evolved to become central to the conduct of any military operation, especially in the last 20 years. These changes have been accelerated since 9/11, after which there has been an increasing convergence on the ideas that global security and economic interests are indeed shaping the views of countries on many national and international issues. Besides the threats emanating from the traditional state vs. state engagements, threats to the security of a nation could also be posed by non-state actors. The spectrum of conflict could range from an asymmetric one to one of high intensity, and even with a nuclear backdrop. To prevent escalation beyond a certain level and to gain maximum advantage in a limited timeframe, military engagements would necessitate a calibrated and swift response. Aerospace power becomes the most appropriate instrument in addressing these security threats.

EFFICACY OF AEROSPACE POWER IN CONTEMPORARY CONFLICTS

All recent conflicts have witnessed the decisive contribution of air power in shaping their outcome. During the Second Lebanon War in 2006, air attacks degraded the capabilities of Hezbollah. North Atlantic Treaty Organisation (NATO) air strikes in 2011 enabled opposition forces to overthrow the regime of Muammar Gaddafi with minimal foreign ground offensive. Similarly, intervention by the French Air Force in Mali in 2013 provided speed and surprise to reduce the offensive momentum of the militants and gave sufficient lead-time for the ground forces to deploy in Central Mali,

thus, restoring government control with minimum boots on the ground. More recently, the ongoing US and French air strikes in **Syria** and **Iraq** against the Islamic State decisively prove that air power has the ability to halt an offensive and set back the best prepared plans of the adversary with time critical targeting.

The effects-based capability of air power platforms and systems has not been lost even on non-state actors. Such non-state actors, too, have slowly graduated from Man Portable Air Defence Missiles (MANPADS) in the Eighties to surface-to-air missiles, as demonstrated in the downing of the Malaysian airliner in Ukraine earlier this year. The recent effort by Islamic State militants to train and fly fighter aircraft is an indication of further transition of non-state actors in the aerospace domain.

THE CHALLENGES OF AIR POWER

The envisaged threats to national security and the conflict spectrum pose a number of challenges that make efficient application of air power more complex. The impact of asymmetry at the operational level for both state and non-state actors is likely to increase. Unconventional warfare would continue to disrupt traditional power projection capabilities, and crises in the future would be more unpredictable, both in nature and timing, affording very little warning to the leadership to respond. Over and above these would be the transitions due to rapidly evolving technology. Since aerospace technologies require considerable time to fructify, their impact on actual outcome from the design table to operationalisation may be significantly more than expected. Therefore, despite the advantages of responsiveness, precision and flexibility, aerospace power faces the challenge of **remaining contextual**, technologically.

The methods of gathering and disseminating intelligence would enhance the availability of information to the war-fighter and the commander. To prevent an information overload, the air force commander will have to greatly rely on inputs from artificial intelligence-based decision support systems. Availability of these systems would affect the degree of transparency and effective utilisation of the intelligence being gathered.

The Gulf War heralded the advent of the media into the battlefield. A ubiquitous media and a highly connected world would pose greater demands on the manner in which military operations are conducted. Each action of the armed forces would need to be justifiable and in conformity with the laws of armed conflict, even within our own country.

Air operations would be characterised by preemptive strikes, reduced response time, enhanced shock effect, and precise and decisive intervention. The challenge needs to be understood in the overall context of aerospace power and its components. This includes both the tangible and less tangible aspects. The tangible aspects in the form of operational capability are afforded by the various combat platforms, support systems and networks that are mostly driven by cutting edge technology. The less tangible elements which have a bearing on the effectiveness of air power are doctrine, concepts of operations, training, leadership, and experience.

AIR DEFENCE

Air defence is a primary task of any aerospace power. Events like 9/11, 26/11, MH 370 and MH 317 have added new paradigms to the dynamic air environment. Proliferation of **remotely piloted vehicles, ballistic and cruise missiles and space-based platforms** has added new **complexities to planning and execution** of air defence operations. In addition, **adventure activities, sub-conventional aerial threats** in the form of **micro or miniature aerial vehicles and air policing requirements along the border** and even in urban areas, are some contemporary issues that have led to the evolution of the concept of 'aviation security.' This is now considered a **responsibility of not only the armed forces, but the civilian stakeholders as well**.

The envisaged increase in the density of civil air traffic and the need to economise operations portends a need to flexibly manage the air space; and yet ensure that the air defence is foolproof. The need of the hour therefore, is to adapt to this change and ensure that military as well as civil air traffic operates to its full potential without hindrance. Thus, the future necessitates that the **air defence assets** are completely **networked, integrated and centralised** through the command and control chain of the nation.

HADR: Air forces are increasingly being called upon to assist in Humanitarian Assistance and Disaster Relief (HADR) operations. The quick response and ability to transcend terrain make air power the most suitable platform for providing timely relief and succour to the populace. Air power has contributed immensely in strengthening the resolve of the government during natural disasters.

TECHNOLOGY

Air power is driven by technological innovations that span the entire spectrum of its operations. The technology we invest in today should be as widely employable as possible because of the long lead times required to realise its full potential. Some of the technologies that would affect aerospace applications are related to **space, airborne sensors, artificial intelligence, composites, advanced aero-engine and airframe designs, sensor fused weapons, missile technologies and networked operations**. Air power needs to leverage the plethora of technologies available so that it can orchestrate its use in a manner that makes the sum bigger than the parts.

The exactness of the application of air power, which has become its signature and the primary reason for its **preference as a force of first choice and a tool of political deterrence**, is more efficiently achieved through the appropriate application of space-based enablers. The development of space technologies includes near real-time global communications, persistent global surveillance, extremely accurate position and navigation information, ballistic missile warning and intercept, meteorology and search and rescue. **Cheaper access** has enabled air forces to leverage the orbital mechanics for deployment of **conventional weapons in space**.

Sensor fusion offers **dynamic and high fidelity situational awareness** to the war-fighter and **compresses the decision loop** through intelligent application of technology to aerospace power. Long range suborbital flights of both aircraft and missiles would become a common feature with employment of scramjet technology.

Future developments in the field of **artificial intelligence, robotics and nanotechnology** will dramatically change the manner in which information

is gathered, processed and acted upon. Information and Communication Technology (ICT) will remain critically important, influencing people's lives with innovations such as cloud computing and Augmented Realities (AR), etc. These will enable users to seek and utilise information as and when desired, globally, 24x7.

Budgetary Allocation: An all pervasive aspect is the availability of funds for developing and maintaining aerospace capabilities. Aviation is an inherently **resource-intensive capability**, within which military air power is at the higher end of the resource spectrum. There is a need for **allocation of the necessary resources** to generating air power, even during long periods of comparative peace. This is crucial because the lead time required to acquire and generate air power is considerably long. Within this ambit, the armed forces in general and the air force in particular need enhanced allocations towards defence budgets.

Indigenisation of Aerospace Industry: Traditionally, India has been reliant on imported technologies to meet its military aviation requirements. To be able to address the demands of the future security environment, our armed forces need to become self-reliant where military hardware is concerned. The current procurement policy provides **adequate opportunities to private industry to play a key role in energising the Indian aerospace industry. The burgeoning demands of civil and military aviation requirements need to be leveraged not only by the Tier I vendors** but must be absorbed by Tier II, III and IV vendors, as well.

DOCTRINAL EVOLUTION

The effective role played by air power has stemmed from a combination of technological advancements, doctrinal precepts, training and focussed leadership. Contemporary conflicts have drawn the attention of air power theorists and practitioners to the more tactical aspects of a conflict rather than a long-term view. From a long-term strategic analysis, it is apparent that the fundamentals of warfare, as opposed to the tactics and responses in specific conflicts, have not changed.

National strategy, political will and the decision-making apparatus would guide the outcome of events in conflict situations. There would be a propensity for asymmetric/irregular warfare due to the escalating costs of total and / or limited wars. Only a rapid response by harnessing the capabilities of all combat and combat support elements, including space and cyber space, would resolve a conflict swiftly. Synergy amongst the stakeholders, both civil and military, would result in success in future military operations. Under clear directions from the leadership, future conflicts and crises would need to be addressed jointly by the armed forces. Being an enabler of surface operations, it is imperative that application of aerospace power and its limitations are both understood by all personnel.

DEVELOPING HUMAN RESOURCES

The **advancements** in the aerospace technologies will bring the domain of knowledge, and its sharing, to the forefront. The **war for talent** will continue and it is unlikely that the rising demand for these intellectuals would get satisfied, thus, creating a talent mismatch as an important challenge for any developing aerospace power.

In future, air warriors should be expected to exploit onboard systems, avoid situational and information overload and respond appropriately under varied circumstances. While the cognitive domain assists in appreciating and responding to situations promptly, higher levels of mental strength would be required to sustain the 24x7 military operations.

Well trained and motivated air warriors are the backbone of the IAF. It is important to prepare them to absorb the high-end technology of the IAF's modernisation process in the shortest possible time. The IAF's vision "People First - Mission Always" aptly puts the focus on our people. Our training pattern evolves to address skill enhancement needs to leverage the potential of human resources and truly transform our air power.

STRATEGIC TRANSFORMATION OF IAF

We foresee a leaner IAF with technologically advanced platforms including aircraft, Surface-to-Air Guided Weapons (SAGWs), Remotely Piloted

Aircraft (RPA), Unmanned Combat Aerial Vehicles (UCAVs) as well as sensors and weapons all networked into one composite system exploiting the space and cyber space mediums.

- Multi-role combat platforms, along with force enhancers like the Fuel Refuelling Aircraft (FRA) and Airborne Warning and Control System (AWACS), would enable the IAF to prosecute air operations in parallel at all levels and across the spectrum of conflict. The flexibility and weapon carrying capability of these platforms enables them to switch roles in mid-air from counter-air to counter-surface.
- Induction of C-130 J and C-17 aircraft has given the IAF the strategic air- lift capability to augment /move forces from one front to the other to provide dynamism to the surface campaign.
- Induction of a variety of rotary-wing platforms from utility to airlift to attack helicopters has enhanced the options for their deployment for surgical strikes against Centres of Gravity (CsOG), insertion / extrication of troops, Spl Ops -- Special Heli-Borne Operations (SHBO), airborne assault, medical evacuation and HADR, even in marginal weather conditions.
- The IAF is in the process of replacing its legacy SAGW units with modern systems like the Medium Range Surface-to-Air Missiles (MRSAM), Akash, SPYDER, Very Short Range Air Defence Systems (VSHORADS) and Close-in Weapon System (CIWS) which would transform our capability in defending the Vital Areas/Vital Points (VAs/VPs).
- A large number of modern radars are being procured to provide multi-tier, multi-layer gap-free radar cover. All these would be networked to provide a composite picture of the air space and enhance situational awareness.
- The IAF is procuring various types of specialist weapons to target the adversaries' ground forces and destroy, degrade and delay them well before they reach the Tactical Battle Area (TBA). Our Intelligence, Surveillance, and Reconnaissance (ISR) assets provide adequate capability to detect the adversaries' attempts to induct ground forces into battle. We would be able to interdict them in an appropriate timeframe.

CONCLUSION

The inherent characteristics of aerospace power make it a highly valuable tool of conflict resolution and statecraft and, undoubtedly, will continue to play a decisive role in the future. Irrespective of the nature of warfare and the type of adversary, aerospace power will be required to achieve a range of effects with discrimination, proportionality and accuracy. It will be on this benchmark that the capability and relevance of aerospace power to national security will be judged. The challenges to air power are many, but they have to be overcome to create reliability and confidence in its abilities. As the vanguard of aerospace power in the nation, the IAF would continue to mature and transform itself into a potent strategic force, technologically at par with the most modern air forces of the world.

Jaihind!

COUNTER-STRIKE: INDIA'S NUCLEAR STRATEGY

MANPREET SETHI

In recent times, there have been several writings suggesting, even demanding, a review/revision of India's nuclear doctrine. Civilian and military voices have expressed anxiety over the inability of the Indian nuclear doctrine to have deterred Pakistan from mounting acts of terrorism against India. They feel that Pakistan's nuclear strategy has been more effective and that it has managed to 'take India for a ride'. Meanwhile, China's ongoing conventional and nuclear modernisation and a growing assertiveness evoke a sense of apprehension. This is further exacerbated by the collusion of China and Pakistan on strategic matters and capability build-up. Pakistan has served as China's proxy, while using terrorism as its own surrogate. Both raise India's security concerns. India's experience of 26/11, the barbaric border incidents, the Chinese incursion into Depsang, irritation over denial of visas to residents of Arunachal Pradesh, etc are only some instances that have contributed to a sense of inadequacy of the Indian response to such threats. A resultant feeling of 'impotency' is manifesting itself as a clamour for change in India's nuclear doctrine.

This article argues that the reasons for the apparent 'softness' of India in handling its security concerns spawn a range of domains – priorities as

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The philosophy on which India's nuclear doctrine is premised is sound, and, hence, the doctrine itself is sensible. But, in order to translate into credible deterrence, it must be operationalised into a workable strategy. Such a strategy should rest on three pillars: capability (warheads and delivery vectors), political resolve (robust military command and control as well as decisive political decision-making), and communication of both (through effective signalling).

outlined by the government of the day, personality of the political leadership, nature of civil-military relations, confidence in military capability, state of the economy, public mood, international climate, etc. Each one of these contributes to engender a sense of disquiet or frustration. But, individually or collectively, they do not make a case for a revision of the nuclear doctrine.

The philosophy on which India's nuclear doctrine[1] is premised is sound, and, hence, the doctrine itself is sensible. But, in order to translate into credible deterrence, it must be operationalised into a workable strategy. Such a strategy should rest on three pillars: capability (warheads and delivery vectors), political resolve (robust military command and control as well as decisive political decision-making), and communication of both (through effective signalling). It is in some of these areas that India has scope for improvement. The anger against the doctrine, therefore, is misdirected. Efforts need to be ramped up on buttressing the other dimensions.

In order to explain these issues in some detail, this article is divided into four parts. The first section undertakes a brief description of definitions of terms such as doctrine, strategy and posture to explain the nuances of

1. A draft of the Indian nuclear doctrine was prepared by the first National Security Advisory Board chaired by Mr K Subrahmanyam. This was made a public document by the government on August 17, 1999, but it remained a draft. A few years later, on January 4, 2003, the Cabinet Committee on Security issued a press note on the operationalisation of the doctrine. This note accepted the basic attributes of the doctrine as credible minimum deterrence and no first use as laid down by the NSAB. But, it did mark a couple of differences too. For more on this, see Manpreet Sethi, "The Trumpet of the Elephant: India's Nuclear Doctrine", in *Nuclear Strategy: India's March Towards Credible Deterrence* (New Delhi: Knowledge World, 2009).

each. The second section identifies and explains the logic and substance of two basic attributes of the Indian nuclear doctrine – No First Use (NFU) and Credible Minimum Deterrence (CMD). The third section suggests the areas for improvement across the three supports of deterrence. The final section concludes with a recommendation for a Strategic Defence Review (SDR) that can help India better communicate its doctrine, strategy and posture to the domestic and international audience. Such an action would alleviate some of the sense of disquiet evident amongst the strategic circles.

A nuclear doctrine may be defined as a set of guiding principles that encapsulates the philosophy or explains the *raison d'etre* of one's acquisition of nuclear weapons. It effectively answers fundamental questions of when, how and where the weapon should be used in the cause of national defence. The doctrine, therefore, serves as a conceptual framework and conveys a sense of the country's worldview.

SEEKING DEFINITIONAL CLARITY

Terms like doctrine, strategy and posture are often confused and even used interchangeably. The three, however, operate on completely different planes and perform different tasks. Clarity on the nuances of each will help understand which dimension needs a change or reinforcement for greater credibility of deterrence.

A **nuclear doctrine** may be defined as a set of guiding principles that encapsulates the philosophy or explains the *raison d'etre* of one's acquisition of nuclear weapons. It effectively answers fundamental questions of when, how and where the weapon should be used in the cause of national defence. The doctrine, therefore, serves as a conceptual framework and conveys a sense of the country's worldview, what it seeks to do, and how. Ashley Tellis, an American strategic analyst, explains India's nuclear doctrine as "a system of beliefs that both describes the utility of nuclear weapons to the state and identifies the manner in which these weapons will be deployed

and used consistent with the purpose for which they have been acquired".[2] Beliefs reflected in a nuclear doctrine emanate from the strategic culture of a nation and essentially reflect its personality, or the idea of the nation. In this sense, the doctrine is relatively abiding and timeless. It changes when the nation decides to amend its core values or belief systems. A doctrine, therefore, is a manifestation of the central spirit or the foundational nature of the state. By doing so, it becomes a guide for nuclear strategy.

A **strategy** is a plan of action designed to achieve an aim. The United States' Department of Defence (DoD) defines it as a "set of ideas for employing the instruments of national power in a synchronized and integrated fashion to achieve national objectives". The purpose of strategy is to achieve the aim that has been defined at the level of principle by the doctrine. For instance, the draft doctrine formulated by the National Security Advisory Board (NSAB) establishes, "India's primary objective is to achieve economic, political, social, scientific and technological development within a peaceful and democratic framework". It further elaborates that "India's strategic interests require effective, credible nuclear deterrence and adequate retaliatory capability should deterrence fail". As is evident, the doctrine maintains nuclear weapons as a tool for deterrence, not for war-fighting. Hence, the nuclear strategy is directed by the doctrine to craft a plan of action that primarily ensures deterrence, but also assures retaliation in the eventuality that it fails. This requires a strategy to devise plans for building a certain amount of stockpile of warheads, developing necessary delivery vectors, having a requisite command and control system, ensuring the survivability of all, and undertaking the necessary communication to convey deterrence.

A **posture,** meanwhile, conveys attitude, approach or frame of mind. It reflects the policy or stance adopted by a government towards capability build-up in terms of personnel and material that would constitute and affect the capacity to fight a war. It could even be an exaggerated or assumed position meant to impress or mislead. The posture, therefore, is more a manifestation of operational issues. But it traces its roots to the plan of

2. Ashley Tellis, *India's Emerging Nuclear Posture: Between Recessed Deterrent and Ready Arsenal* (Santa Monica, CA: RAND, 2001), p. 260.

action designed by strategy, which itself derives its guidance from the principles reflected in the doctrine.

Evidently, the three formulations work at different levels. Posture, from among the three, is most likely to undergo modification in keeping with the changing threat environment. It could become more or less militant, or more or less defensive, depending on the nature of threat perceptions. For instance, during the Cold War, the US and USSR kept their nuclear forces on a high alert posture. Since the end of the Cold War, this posture has progressively relaxed on both sides. India's own nuclear posture has evolved from one that reflected recessed deterrence to one that will indicate a more ready arsenal especially once the SSBNs (nuclear powered submarines) become operational in due course. However, the very fact that India has opted for a nuclear strategy of building a nuclear triad to ensure the survivability of its arsenal is a directive obtained from the no first use principle of the doctrine. Doctrine, strategy and posture are indeed interlinked, each flowing from the previous, and operating in its own medium and sphere of action.

INDIA'S NUCLEAR DOCTRINE: TWO ESSENTIAL ATTRIBUTES

Counter-Strike/ No First Use

According to a well known military strategist, Barry Posen, "A military organisation prefers to fight its own war and prevent its adversary from doing so ... An organisation fighting the war it planned is likely to do better than one that is not."[3] This is because offence allows the military to stay with its pre-deliberated course of action while denying the adversary the advantage of being able to play out his moves. With conventional weapons, it is possible for armed forces to stick to their war-time Standard Operating Procedures (SOPs). They can concentrate on the first phase of war to be undertaken by them at the time and place of their choice and thereby either increase the chance of their victory or lessen the damage of war on

3. Barry R. Posen, "The Sources of Military Doctrine," in Robert Art and Kenneth Waltz, eds., *The Use of Force: Military Power and International Politics* (Boulder, Colorado: Rowman and Littlefield Publishers, Inc., 2004), p. 24.

Some have argued that India was trying to earn brownie points or blunt international opprobrium for its overt nuclear testing when it accepted NFU. However, while these came as incidental collateral benefits of the NFU doctrine, it was the military logic that held sway over a majority of the NSAB members.

themselves. But the equation gets skewed with the entry of nuclear weapons.

In a situation where both sides have secure counter-strike capabilities, even if it is not a situation of mutual assured destruction, a nuclear first strike, however splendid it might be, cannot rule out the possibility of nuclear retaliation. Hence, the calculation of the first user cannot be limited to the damage it will cause by his first strike, but must also take into account the damage in space and time that it will suffer from the adversary's response with a weapon of mass destruction. Therefore, an offensive nuclear strategy can neither assure victory, nor promise no nuclear damage to self. And, given the nature of the weapon (whose effect transcends space and time), no rational government could brook any nuclear damage as acceptable.

This logic prompted India to accept NFU as a doctrinal principle. Some have argued that India was trying to earn brownie points or blunt international opprobrium for its overt nuclear testing when it accepted NFU. However, while these came as incidental collateral benefits of the NFU doctrine, it was the military logic that held sway over a majority of the NSAB members.[4] They discussed the issue at length and found many advantages of an NFU. But before discussing these, it would be worthwhile to examine two scenarios in which it is believed India might be tempted to resort to first use of nuclear weapons.

The first of these builds such a case mostly in the context of a conflict with China. In a hypothetical scenario, if India was facing the prospect of conventional defeat, it is assumed that it might be tempted to use nuclear weapons. But, the question that needs to be answered is: how would India

4 As learnt during many discussions on the subject with Air Cmde Jasjit Singh who was one of the authors of the doctrine as part of the first NSAB.

gain by using the nuclear weapon? In fact, once it has done so, its fate would shift from being defeated-now-but-living-to-fight-another-day to one of severe damage/annihilation since China would respond with its nuclear weapons too. Jonathan Schell explained this dilemma well when he questioned, "For how can it make sense to 'save' one's country by blowing it to pieces? And what logic is there in staving off a limited defeat by bringing on unlimited, eternal defeat? Nuclear deterrence is like a gun with two barrels, of which one points ahead and the other points back at the gun's holder."[5] Robert McNamara made a similar argument based on his experience of more than 40 years of making and overseeing nuclear war plans. He wrote, "During that time [when in office], I have never seen a piece of paper that outlined a plan for the United States or NATO to initiate the use of nuclear weapons with any benefit for the United States or NATO… To launch weapons against a nuclear-equipped opponent would be suicidal."[6] Indeed, there is no way to effectively contain a nuclear strike and there can be no guarantee against unlimited escalation once the first nuclear use/strike occurs. Therefore, India would not have defended itself even after using the nuclear weapons first. It might have the satisfaction of having wrought nuclear damage on the adversary, but it would also carry the guilt of having brought a nuclear strike upon itself.

A second scenario revolves around the question of whether India should stick to NFU if it gets to know that the adversary is preparing for a nuclear strike? Should not nuclear preemption then be the right step? The answer to this lies in understanding that even preparation is no guarantee of a nuclear strike. Rather, it may well be part of a strategy of "coercive diplomacy." It is not a coincidence that nearly all of the more than 50 incidents of threat of use of nuclear weapons until now have actually intended coercion.[7] Therefore, despite the apparent show of readiness, there could still be a chance that nuclear weapons would not actually come into use. But by striking first in

5. Jonathan Schell, *The Abolition* (Stanford, CA: Stanford University Press, 2000), p. 54.
6. Robert McNamara, "Apocalypse Soon," *Foreign Policy*, May-June 2005.
7. For a comprehensive list of incidents until 1996, see Jasjit Singh, "Why Nuclear Weapons," in Jasjit Singh, ed., *Nuclear India* (New Delhi: Knowledge World, 1998), pp. 12-13.

A country even with a first use doctrine may or may not use its nuclear weapons despite the projected preparedness, but after having been struck and where the first strike has not been disarming or decapitating (which is well-nigh impossible with the kinds of arsenals states with nuclear weapons today have), retaliation would be a certainty.

the face of apparent projected readiness by the adversary, India would end up inviting retaliation for certain. A country even with a first use doctrine may or may not use its nuclear weapons despite the projected preparedness, but after having been struck and where the first strike has not been disarming or decapitating (which is well-nigh impossible with the kinds of arsenals states with nuclear weapons today have), retaliation would be a certainty.

Therefore, under neither of these circumstances does it seem to make sense to use nuclear weapons first. In fact, the act of using nuclear weapons first is not as easy as it is believed to be since the first user has to take into account not just what would happen in the first phase of war, but also on how it would proceed and end—scenarios which are not easy to coherently contemplate in the presence of robust retaliatory nuclear weapons. Hence, even countries with a first use strategy find it very difficult to actually execute it, and also politically limiting to do so. This is a thought worth considering since conventional wisdom has us believe that first use is more liberating compared to a counter-strike strategy. But serious thought to actual execution of first use reveals the complexities involved in doing so. After all, the purpose of first use should be to convey deterrence through communication of four essential messages:

- I will not hesitate to use the weapon first.
- By doing so, I would be able to substantively improve my situation.
- My first strike will interfere with, and degrade, your second strike capability.
- I will be able to *come out of the crisis looking better after the use* of the nuclear weapon than without its use.

The credibility of this communication, however, is seriously jeopardised if the adversary has a survivable nuclear force. Retaliation, in that case, complicates the calculations of the first user on how it could "look better" after suffering nuclear damage to itself. As graphically explained by a strategist, "Engaging in a nuclear war with a nation with which one is in a condition of mutual vulnerability would be like running a red light across a high speed, heavily travelled, multilane highway under conditions of near zero visibility. One might make it safely across, but one could not form a reasonable expectation that one would."[8]

Therefore, the essential question that the first user has to consider is whether in a state of mutual vulnerability, he can emerge in a better position against one who can retaliate? Or can NFU convey its own set of messages more convincingly:

- I will not be the first to use nuclear weapons.
- But *any first use (irrespective of yield, target or extent of damage) would trigger assured retaliation to cause damage of a kind that you would find unacceptable*.
- My counter-strike will ensure that your material situation is worse off after your having used the weapon first.
- I might suffer losses, but you will not escape either and you would have brought it upon yourself.

As is clear from the above, an NFU strategy bravely offers to concede the onus of escalation to the adversary. It thereby becomes more liberating in many ways. For one, it is beneficial from the *point of view of nuclear arsenal requirements*. First use postures based on projection of nuclear war-fighting require large arsenals of first strike weapons (such as accurate missiles with multiple independently retargetable vehicles), nuclear superiority to carry out counter-force attacks against an adversary's retaliatory forces, elaborate and delegated command and control structures to handle Launch on Warning (LoW) or Launch Under Attack (LUA) postures to launch simultaneous nuclear attacks from, and over, dispersed forces. NFU, on the other hand,

8. Steven P. Lee, *Morality, Prudence, and Nuclear Weapons* (Cambridge: Cambridge University Press, 1993), p. 16.

requires building nuclear forces which need not be in large numbers, but which are ensured survivability through a mix of measures that include hardening of nuclear storage sites, deception, mobility, dispersal over different delivery vectors, and a level of defence. The core of this strategy lies in projecting the invulnerability of a sufficient part of the arsenal to even a worst case first strike and a near automaticity of retaliation which can cause damage that the adversary is unlikely to find acceptable vis-a-vis the gains made through the first use.

Secondly, NFU is liberating from the *point of view of military command and control*. It allows the military to adopt a more relaxed posture rather than straining at the nuclear leash in a hair-trigger alert posture that can easily fall prey to misadventure. Neither does it have to perfect the logistics of first use which is not easy considering that it would involve coordinating a nuclear attack on a diversified arsenal with speed and surprise to hit the adversary's forces before they can be launched or dispersed. It involves addressing complicated questions such as whether to launch aircraft first or missiles, how many to launch in the first wave, etc. A credible first use requires forward deployment of nuclear forces which also increases the likelihood of accidental or unauthorised use. The LOW/LUA postures require pre-delegation of authority to launch nuclear weapons and this can never be a risk-free option. Responsible command and control is not easy to enforce at each level given that in times of crisis, lack of information, misinformation and misjudgments could often become causes of confrontation without either side having the intention to precipitate one. As Robert McNamara once said, "It is correct to say that no well-informed, coolly rational political or military leader is likely to initiate the use of nuclear weapons. But political and military leaders, in moments of severe crisis, are likely to be neither well-informed nor coolly rational."[9]

NFU eases this dilemma. Ironically, this becomes *liberating for the adversary* too, which paradoxically is beneficial to self. NFU alleviates the adversary's insecurity by relieving pressure on its leaders for launching a

9. Robert McNamara, *Blundering into Disaster: Surviving the First Century of the Nuclear Age* (London: Bloomsbury, 1987), pp. 13-14.

preemptive strike. If the adversary were constantly under the fear that a nuclear strike was imminent, his own temptation to use his nuclear force would be higher. But, NFU helps to mitigate the 'use or lose' pressure and thereby lessens crisis instability since it sends a message that does not place the adversary on the edge at all times.

Finally, NFU *frees the political leadership from the psychological pressure* of taking the difficult decision of using a *Weapon of Mass Destruction* (WMD). This is sure to weigh on him/her personally for the damage caused and for the international opprobrium for having breached a nuclear taboo. And to top it all, to do so in the knowledge that own vulnerability to retaliation can yet not be escaped. Therefore, rather than having the first use/strike option, it would be better to take measures to deter the adversary. Deterrence is, in fact, the only real defence against nuclear weapons.

In view of all of the above, NFU appears far more sensible and credible. While a country would find it very difficult to use the weapon first, the decision of retaliation would be far easier, seemingly legitimate, and more guilt-free to make. In fact, by projecting assured retaliation, a nation displays greater confidence, and, hence, greater deterrence credibility. And, by establishing the nuclear weapon as an instrument of punishment through retaliation, the country lessens the possibility of deterrence breakdown, and, thus, minimises, if not prevents, the very use of nuclear weapons. NFU actually encourages the possibility of 'no use' instead of 'sure use'.

Therefore, through NFU, coupled with assured retaliation, a country can rein in the initiative more in favour of no use of nuclear weapons. Unless the adversary is completely irrational, has suicidal tendencies or is utterly unmindful of national survival and international public opinion, the possibility of a nuclear war should not arise.

CREDIBLE MINIMUM DETERRENCE (CMD)

The rejection of the concept of nuclear war-fighting frees India from the need to match the nuclear arsenal of its adversary/(ies) weapon for weapon. It was stated by Kenneth Waltz several decades ago, "Forces designed for war-fighting have to be compared with each other. Forces

A deep study of the strategic culture, the socio-psychological make-up, the economic growth (the more developed the country, the less the loss it would be willing to take as a result of a nuclear exchange), and the nature of the political system (the more closed a system, the greater the loss it could take) among other factors, is necessary to make a considered judgment of what would be unacceptable for the adversary.

designed for war deterring need not be compared. The question is not whether one country has less than another, but whether it can do unacceptable damage to another…."[10] With the principal role of India's nuclear force being to protect the nation from nuclear blackmail and coercion, instead of any desire to annex or mount aggression, the country's policy-makers perceive the need for only 'credible minimum deterrence'. Official pronouncements, however, have refused to be drawn into quantifying the minimum. Rather, the actual size and composition of the nuclear arsenal is left to the assessment of threats and own technological capability. As Jaswant Singh, India's foreign minister in 1998, had said, "The minimum is not a fixed physical quantification. It is a policy approach dictated by, and determined in, the context of our security environment. There is no fixity. Therefore, as our security environment changes and alters and as new demands begin to be placed on it, our requirements too are bound to be evaluated."[11]

While the determination of CMD would change with transformation of threat perceptions and technological developments [such as deployment of an effective Ballistic Missile Defence (BMD) by the adversary], it definitely need not seek superiority or even parity with an adversary's nuclear forces in the numbers, yields or types of weapons. However, this freedom is qualified by the need to acquire an *assured counter-strike capability* that can inflict *unacceptable damage* on the enemy. As is

10. Kenneth Waltz as quoted by Gen Sundarji, *The Blind Men of Hindoostan* (UBS Publications Distributors, 1993), p. 68.
11. External Affair Minister's speech in Parliament on December 16, 1998. Downloaded from http://www.meadev.gov.in.

evident from this statement, CMD imposes two essential prerequisites for credible deterrence.

Taking the second part of the statement first, the numbers have to be of an order that appears capable of inflicting unacceptable damage (despite suffering a first strike). This raises the question of how does one estimate the unacceptability threshold of the adversary. It cannot be easy and nuclear strategists have warned of the dangers of mirror imaging where one assumes that what is not acceptable to self would also not be acceptable to the adversary. But, this may not hold true. A deep study of the strategic culture, the socio-psychological make-up, the economic growth (the more developed the country, the less the loss it would be willing to take as a result of a nuclear exchange), and the nature of the political system (the more closed a system, the greater the loss it could take) among other factors, is necessary to make a considered judgment of what would be unacceptable for the adversary.

Fortunately, it is not very difficult to impose punishment with nuclear weapons. By their very nature, they impose huge damage on life and property that cannot be restricted in time and space. Moreover, given the high density of population in this region, punishing a first user with unacceptable damage neither calls for the kinds of numbers that the superpowers built, nor the kinds of yields that they experimented with. A sufficient number of kiloton weapons dispersed intelligently over the target and made to explode at an intelligent height to maximise damage suffice for credible deterrence.

In this respect, the aspersions cast on the thermonuclear capability of India are quite irrelevant. It may be recalled that in 2009, a set of Defence Research and Development Organisation (DRDO) scientists had questioned the veracity of the results announced by the Development of Atomic Energy (DAE) on the thermonuclear yield of the test. The DAE had defended its stand. Irrespective of who one believes, the point is that nuclear weapons, even, if not of megaton yield, are powerful deterrents. The weapons dropped on Hiroshima and Nagasaki were only 15-20 kiloton in yield. And yet they scarred the human mind enough to not merit a repeat performance. Of

In the current international climate, it is virtually impossible for India to consider the conduct of another series of tests to establish its thermonuclear capability beyond doubt to the satisfaction of the sceptics. But, fortunately, desirable though it might be considered by some, it is not essential for deterrence.

course, there is an argument to be made that H-bombs make more economic sense when carried on expensive, inaccurate Intercontinental Ballistic Missiles (ICBMs). They are believed to provide more bang for the buck. But, given the number of people who would be threatened by India in case of counter-strikes on cities, can the loss of life and property caused by a kiloton weapon be less of a deterrent? Would it matter to the adversary, or to India, whether the destruction was caused by a fission or fusion weapon as long as it caused unacceptable damage? In the current international climate, it is virtually impossible for India to consider the conduct of another series of tests to establish its thermonuclear capability beyond doubt to the satisfaction of the sceptics. But, fortunately, desirable though it might be considered by some, it is not essential for deterrence.

The second requirement of deterrence based on counter-strike relates to the criticality of ensuring that sufficient warheads and delivery vehicles survive a first strike and are available for retaliation. This calls for survivability measures such as hardened silos, mobile launchers, deployment beyond the reach of hostile delivery systems, dispersion of the arsenal on a triad, and a pre-determined chain of succession for the weapon release authority. Reliability of the delivery vectors is critical for deterrence credibility and this includes dependability of communication (that the correct message is delivered at the right time for launch) and reliability of launch (that the missile actually lifts off); of the booster (that it ignites in time); of separation (of the booster from the missile after burn-out); of penetration (despite enemy air defence systems); and of detonation at the designated target.[12]

12. For more on this, see Sundarji, n. 10, p. 76.

While each of these requires a technological sophistication, fortunately, deterrence requires more of mind and perception management to convey the idea of nuclear damage than inflicting the damage itself. More important, instead, is the need to convey the message that no use of the nuclear weapon would go unanswered. This, then, bring us to the realm of strategy from doctrine.

INDIA'S NUCLEAR STRATEGY – WHAT'S AMISS?

While the Indian nuclear doctrine is propounded on sound logic, aspects of its operationalisation into a credible deterrent strategy still require some pieces to either be built, further improved, or effectively communicated. As mentioned earlier in the paper, such a strategy must be built on the three pillars of capability, resolve and communication. An examination of each would reveal the areas where there is scope for improvement.

Capability Build-up -- Milestones yet to be Achieved

While CMD requires India to build an arsenal just large enough to inflict unacceptable damage, NFU imposes the requirement of building it in such a manner as to ensure retaliation after absorbing a first strike. For effective deterrence, therefore, a certain amount of nuclear hardware is critical. This essentially involves two things: nuclear warheads and delivery vectors. On the first, the nature of the five nuclear tests in 1998 has equipped India with the capability to build a range of nuclear weapons – from sub-kiloton to thermonuclear. India's nuclear doctrine has no need for the first kind, commonly referred to as tactical nuclear weapons, primarily because India has eschewed the concept of nuclear war-fighting. India conveys deterrence through the threat, nay promise, of punishment through assured retaliation. Therefore, the adversary's use of even battlefield weapons will be met with a punishing response that he would find unacceptable.

This requires nuclear delivery vectors of adequate ranges and reliability to inflict punishment. Over the last decade, efforts have been visible in the development and gradual deployment of a number of land-based ballistic missiles to fulfill this role. Short range Prithvis and intermediate range Agni variants are already operational. Graduating to the next level, the

long range Agni V missiles are likely to become operational before the end of this decade. This would enhance India's deterrence, especially vis-a-vis China. However, work on three other technological capabilities is necessary to further the cause of credible deterrence.

The most urgent pending task is the operationalisation of the sea-based leg of India's nuclear triad. While mobility is an important advantage of land-based missiles and most Indian missiles are rail and road mobile, the highest level of survivability lies in placing nuclear tipped missiles with sufficient ranges on nuclear powered submarines (SSBNs). This is the most survivable of the three delivery vectors and, hence, the projection of credible deterrence is best achieved through SSBNs carrying Submarine Launched Ballistic Missiles (SLBMs) of adequate ranges. The INS *Arihant*, India's first SSBN, setting out for sea trials in 2014, will mark but the start of what will be a long journey of building an operational SSBN force. While more boats are planned, India is still lagging in the range of the SLBMs. What have been tested until now and that too from underwater pontoons, not submarines, are the K-15 with a range of 700-750 km and more recently in March 2014, the K-4 with a range of 2,000 km.[13] These ranges are insufficient for credible deterrence against China. The missiles have to go up to at least 5,000 km and more to reach targets whose loss is deemed unacceptable by the adversary while own platforms stay out of harm's way. A submarine launched version of the Agni-V should be the next technological milestone in the service of credible deterrence.

Secondly, focus has to be retained on improving the penetrability of Indian missiles. Given China's BMD, even if of limited capability, Indian missiles will have to be equipped with counter-measures to evade interception in order to convey the capacity to cause unacceptable damage. Development of Multiple Reentry Vehicles (MRVs), which hit the same target with many bombs, and Manoeuvrable Reentry Vehicles (MaRVs) that can drastically change trajectory to evade interception in the terminal stage, are capabilities that will help in buttressing deterrence.

Thirdly, improving the accuracy of the Agni-V would be a worthwhile effort. Of course, this is not necessary for the missile in its nuclear role and

13. "India Tests New Underwater Nuclear Missile", *The Times of India*, March 26, 2014.

according to reports, it already has a fairly good accuracy which should suffice for nuclear retaliation on densely populated cities. In any case, for the time being, the missile is to be built in adequate numbers to project nuclear deterrence. But, in the long run, an accurate long range ballistic missile will serve to convey conventional deterrence too. As is known, the USA is pursuing the Global Prompt Strike (GPS) which envisages the use of strategic missiles with conventional warheads in order to reach distant but time sensitive targets. Blurring of lines on conventional and nuclear missiles appears to be the emerging trend and China too keeps both kinds of missiles under the control of the Second Artillery Corps. India must be mindful of this trend and seek to enhance the accuracy of all its missiles for better conventional deterrence.

Power projection is a valid task of a missile and the very act of testing sends a powerful signal. The two tests of the Agni-V have been duly noted by India's regional adversaries as well as by the international community. Further capability build-up is necessary. But that can meet only half the requirement of credible deterrence. The second half must be conveyed through evidence of political resolve.

Political Resolve

The actual use of the nuclear weapon is a political decision. Therefore, for deterrence to be credible, visibility of political will through an organisational set-up reflecting institutional decision-making is crucial. There is a dire need of conducting periodic scenario building exercises and regular threat assessments to equip the political leadership with the requisite understanding on how to play the sophisticated game of nuclear deterrence.

A former minister of Pakistan mentioned to me at an international conference that Rawalpindi believed that its nuclear weapons had practically obviated the possibility of a conventional Indo-Pak War. India, he believed and he claimed so did his countrymen, would never have the motivation or the political will to initiate a conventional war owing to the fear of escalation. In making such an assumption, it is clear that Pakistan is not doubting India's capability, but its will to mount retaliation. Two

In fact, it must also be mentioned that during the Cold War, even after building the kind of stockpile the US did, it gave up massive retaliation as an incredible strategy. It was seen to place Washington in a 'put up or shut up' dilemma and, hence, considered incredible and insufficient to deter. The USA opted instead for the strategy of flexible response.

issues then beg addressing from India. One, communication of political resolve to punish Pakistan when acts of terrorism are traced to the establishment, and secondly, communication of a kind of retaliation that sounds credible.

Communication and Signalling

Indeed, the most important pillar of the credibility of deterrence is communication. The capability build-up is meaningless if the adversary does not know about it, misreads it, or if it doubts the resolve of the country to put it to use. It is critical, therefore, to convey a coherent and consistent message to the adversary so that he does not premise his own nuclear strategy on mistaken assumptions. Simultaneously, communication is necessary to reassure the domestic populace and to enhance their understanding of security issues confronting the nation.

Fortunately, communication of resolve can be displayed across a range of issues. In fact, the resolve does not have to be conveyed through the conduct of a conventional or nuclear war. That would be foolish. But, its evidence on issues as varied as stringent law and order enforcement at home, firmness in policy making and pursuit of inter-state relations, zero tolerance for terrorism, etc can effectively convey it. More specific to the nuclear domain could be actions such as providing information on the meeting of the Political Council of the Nuclear Command Authority to consider India's threat environment or on conduct of military war-games in which the use of nuclear weapons by the adversary is factored in and successfully handled.

The second aspect of communication relates to the credibility of the kind of punishment that is being threatened. The NSAB draft doctrine had

qualified retaliation as *assured punitive*. But the 2003 Cabinet Committee on Security (CCS) note changed this to *massive retaliation*. Coming in the aftermath of the long mobilisation of Operation Parakram that achieved little by way of India's objective of getting Pakistan to give up terrorism, and also after the delineation of vague, ambiguous but very low red lines by Pakistan[14], it was felt that the use of the term massive would better deter Pakistan from contemplating easy or early use of nuclear weapons since India's response would be suicidal for it.

However, the change of language failed to enhance the credibility of the deterrence, particularly since it was not backed by an exhibition of firm political resolve. In fact, it must also be mentioned that during the Cold War, even after building the kind of stockpile the US did, it gave up massive retaliation as an incredible strategy. It was seen to place Washington in a 'put up or shut up' dilemma and, hence, considered incredible and insufficient to deter. The USA opted instead for the strategy of flexible response.

But for India, flexible response premised on nuclear war-fighting is not the answer. In fact, the language in the draft nuclear doctrine that spoke of assured punitive retaliation without qualifying the nature of retaliation in terms of its magnitude had been a wise choice. Given India's subscription to NFU, the message of the *assuredness of retaliation to cause unacceptable damage* is far more critical than the magnitude of retaliation.

Having made this change, however, in 2003, it now seems difficult in today's political climate for India to return to the language of the draft doctrine. In such case then, the focus must be on enhancing the expression of resolve to indicate that India would not hesitate to consider a counter-strike that would result in disproportionate loss to the adversary. It would not climb the escalation ladder one step at a time. Just as Pakistan claims that there is a one rung escalation ladder that would take it up from India's conventional response to a nuclear riposte, India should communicate that it too has a one rung ladder that would take any nuclear use (in the battlefield or otherwise) to a nuclear retaliation that would result in substantial damage to the adversary.

14. Statement made by Lt Gen Khalid Kidwai, then director general of the Strategic Plans Division, a pivotal organisation in Pakistan's National Command Authority, in an interview in 2001.

It is to the credit of the government that in 1999, just fifteen months after the conduct of the nuclear tests, the nation was presented with a draft nuclear doctrine. It was followed up by a two page "Operationalisation Note" of the CCS in 2003. But since then, for over ten years now, there has been silence.

For this message to carry weight, it is equally important that there is greater transparency of the military dimension of the nuclear command and control too, including redundancies that assure automaticity of nuclear response. Consequently, there is a requirement for strengthening the public profile of the Strategic Forces Command. The knowledge of the existence of this tri-Service organisation and a level of calibrated transparency on its role and mandate would go to assure the Indian public, while simultaneously sending the signal of intent and purpose to the adversary. As said by an analyst, "It makes no sense to surprise an opponent with unanticipated retaliation when a clear signal could have deterred unwanted activity in the first place"[15]. Therefore, indications of measures being taken to ensure survivability of the chain of command at the primary, secondary and even tertiary levels would be prudent.

It is to the credit of the government that in 1999, just fifteen months after the conduct of the nuclear tests, the nation was presented with a draft nuclear doctrine. It was followed up by a two page "Operationalisation Note" of the CCS in 2003. But since then, for over ten years now, there has been silence. India has not thought of bringing out a document like a Strategic Defence Review (SDR) (or whatever it may be called) that could flesh out the country's nuclear threat environment, its deterrent strategy and posture, the focus of immediate priority, as well as a long-term approach to issues of non-proliferation and disarmament.

This article recommends an Indian SDR to meaningfully fill the prevailing 'information vacuum' on nuclear issues. Of course, it cannot be denied that some amount of opacity is necessary for nuclear deterrence,

15. James J Wirtz, "Deterring the Weak: Problems and Prospects", *Proliferation Papers*, IFRI Security Studies Centre, Fall 2012, p. 7.

but calibrated transparency on some nuclear aspects is equally critical for credible deterrence.

STRATEGIC DEFENCE REVIEW

Nearly all nuclear weapon states periodically issue an official statement in the form of a Review or a White Paper to provide a peep into their threat assessments and response priorities. The US Nuclear Posture Review (NPR) is a well known document. Russia too periodically announces a military doctrine and has used it to signal change in the circumstances of the use of nuclear weapons. Since 1998, China has been bringing out a White Paper on National Defence (WPND) mostly every two years to indicate how it conceptualises its national defence, threat perceptions and security goals, including in the nuclear domain. So do the UK and France.

Most such documents provide general indications on the nation's assessment of its threat environment and the kind of capability that it wishes to build. For instance, the US NPR of 2010 identified nuclear terrorism and proliferation as the topmost threats facing the country. Accordingly, Washington put its focus on global efforts aimed at securing nuclear materials while clearly articulating the threat that countries found guilty of sponsoring terrorists would be subjected to American military strikes. Since the threat from near nuclear peers was found of a second order, the US downgraded its nuclear readiness posture by removing the nuclear bombers from 24 hour alert and also de-MIRVing its missiles. Nevertheless, the NPR did mention the development of conventional capabilities as also those necessary to operationalise its GPS strategy.

Similarly, the Chinese WPND explains the country's threat perceptions and national security goals. Divided into many sections, it provides generic references to the growing advancements in the country's ability to conduct joint operations with precision, informationised strikes, etc. Over the last three White Papers, China has devoted complete sub-sections to explaining the role and capabilities of its Strategic Artillery Force (SAF). While the 2008 paper had called upon the SAF to "build a streamlined and effective strategic force by raising the informationisation of its weaponry and

equipment systems, build an agile and efficient operational command and control and increase capabilities of land-based strategic nuclear counter-strikes and precision strikes with conventional missiles", the 2010 paper stressed modernisation of "capabilities in rapid reaction, penetration, precision strike, damage infliction, protection and survivability". Given that the SAF has the responsibility for both conventional and nuclear missiles, the paper also reveals how China continues to "improve the conditions of on-base, simulated and networked training" including in conduct of "trans-regional maneuvers" and in "complex electromagnetic environments". Such disclosures on posture are meant to buttress deterrence.

Crafted along the lines of SDRs issued across the world that provide generic indications on threats and the means to tackle them, an Indian SDR would be particularly helpful in addressing some of the concerns that have been raised in recent times on the credibility of the Indian nuclear deterrent. Besides a reiteration of the basic doctrinal attributes of India's nuclear capability, the SDR could highlight some specific issues. Two examples by way of illustration could be mentioned. The first could be an articulation of the role of missile defence in India's nuclear strategy. Going by the recent technological developments, India seems to be surely and steadily moving towards the development and eventual deployment of some kind of a BMD capability. However, if India is to ensure that this capability does not destabilise the nuclear deterrence equations with Pakistan and China, it is imperative that certain clarity be brought to the nature and type of BMD that India plans to have. Right now, the country seems to be driven by the technological euphoria generated by a series of successful missile intercepts. Meanwhile, Islamabad perceives it as eroding its deterrence capability and has begun investing in cruise missiles and other counter-measures to defeat an Indian BMD. In case India is to escape being pulled into an offence-defence spiral, it is necessary that the logic and scope of the Indian BMD is explained. This capability can best be used as a measure for enhancing the survivability of its retaliatory capability (warheads, delivery systems and command and control) in view of India's NFU, rather than protecting cities. Given India's missile threat environment, the latter is virtually impossible

unless the BMD is technologically of a very high order and that obviously means expending large amounts of money. But, by explaining the rationale of the BMD for defence of counter-strike, its destabilising effects can be arrested. And, the SDR could be one means of such communication.

Yet another issue that could do with some clarity is India's response to an act of nuclear terrorism. Given India's past experience of Pak-sponsored terrorism, this is a threat that looms large. It would be worthwhile for New Delhi to express its assessment of such a threat and its likely responses. This would showcase resolve that no such act would go unpunished. Doing so through the SDR would enhance deterrence.

Opacity and ambiguity in nuclear numbers and postures has been an attribute of the Indian nuclear strategy. However, an SDR can perform the crucial task of clearing misperceptions through a certain amount of transparency without going into the specifics of the arsenal. This is critical given that misperceptions and miscalculations can result in an inadvertent nuclear escalation, especially between nuclear neighbours that share border disputes and are prone to border skirmishes.

Such a document would actually be of immense value for two reasons. One, it would aid strategy formulation and action prioritisation within the country while providing assurance to the domestic public. As Shyam Saran said in a lecture on the subject, "There is need to take the people of India into confidence about the risks and benefits of maintaining a nuclear deterrent. In a democracy, this is critical to upholding a broad consensus on dealing with the complex and constantly evolving security challenges our country confronts." Meanwhile, the SPR would communicate with the adversary and its content and tenor could create the atmospherics to help stabilise nuclear equations.

CONCLUSION

No doctrine is cast in stone. It reflects national political, economic and technological realities and could change as these parameters transform. But, for the time that it exists, a nuclear doctrine performs the crucial task of providing a window to how a country perceives its nuclear weapons.

It explains why it needs these WMD and how it plans to use them in the achievement of those objectives. India has premised its need for nuclear weapons on safeguarding itself against nuclear coercion or blackmail. Accordingly, New Delhi has enunciated a nuclear doctrine that perceives a political role for its nuclear weapons. It ascribes to NFU since it holds that the weapon has no role in enforcing compellence or staging aggression, but will only be usable in a situation where an adversary has first used such a weapon. In such a situation, the doctrine prescribes assured retaliation to inflict unacceptable damage. In order to carry out this exercise, the doctrine aspires for a minimum number whose credibility resides in its survivability.

The operational nuclear strategy as flows from India's nuclear doctrine provides the least risk option in the presence of nuclear weapons. It premises nuclear deterrence on a small arsenal that is not on hair-trigger alert, and, hence, is less open to the possibilities of miscalculation or accidental use. At the same time, given its own orientation towards counter-strike to impose punishment, the strategy seeks to minimise the chances of nuclear use in the first place. The credibility of the deterrent strategy still requires some capabilities to be developed, but that is work in progress. Given India's size in terms of its geographical expanse, material resources, economic strength, technological prowess and human resource potential, there are many factors that are in the country's favour. Much has been accomplished in terms of operationalisation of the strategy in capability build-up as well as in institutionalisation of the political and military command and control. Unfortunately, not enough has been disclosed. And this has led to a sense of lack of reassurance at home and assumption of lack of resolve to act across the borders. Therefore, this is the area that should be the focus of the government of the day. The doctrine of counter-strike meanwhile is a wise one and does not need to be altered. As Jasjit Singh wrote, "We will need to shape our strategy in such a way that as far as possible, nuclear weapons don't come into play to affect our security calculus." The Indian nuclear doctrine that establishes a unique brand of nuclear deterrence does its best to ensure such an eventuality.

NATIONAL SECURITY SCAN: ARE THE GOOD DAYS COMING?

P.V. NAIK

INTRODUCTION

The euphoria of the epic general elections is over. As per statisticians, at least 33 percent of voters are absolutely thrilled at their sagacity. The mood in the country is upbeat despite El Nino and the economic slowdown. Although the average citizen knows in his/her heart that things cannot change in a hurry, the mounting inflation and the dismounting subsidies are already causing heartburn. In the meanwhile, by all reports, the government seems to have got down to putting in place a more responsive and hygienic system of 'governance'.

Today, the South Asian region ranks as one of the three flashpoints in the world along with the Middle East and North Korea. Within this region, lies a group of nations in troubled transition to modernity, their external discourse damned by internal contradictions. In a world moving towards integration, many of these nations remain torn by ethnic and religious strife, economic disparities and political instability. For obvious reasons, it is full of turmoil. The internal dynamics and external influences have led to increase in the degree of uncertainty.

As a member of this region, India remains vulnerable to the disturbances spilling over from its neighbours. India itself is at a crossroads. We witness

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As a member of this region, India remains vulnerable to the disturbances spilling over from its neighbours. India itself is at a crossroads. We witness this giant stirring into wakefulness – into an awareness of its power today. This rise in stature brings with it greater responsibilities and a larger role in regional as well as global affairs.

this giant stirring into wakefulness – into an awareness of its power today. This rise in stature brings with it greater responsibilities and a larger role in regional as well as global affairs. This demands not only a change in policy, internal and external, but a fundamental change in our very thinking, ethos and value system. This, then, is the challenge before the government. It is in an unenviable position of having to balance the vast burden of public aspirations with some hard-headed, tough governance, on the one hand; boost the sagging economy on the other hand; and, at the same time, convince the world that we are not to be trifled with. What, then, should the priorities of the government be?

PRIORITIES: AN OVERVIEW

The government has been blessed with a massive mandate by the people of India. Public participation and media hype have, perhaps, been unprecedented in recent history. But therein lies the rub. Now everyone from the *chaiwala* to a Chief Executive Officer (CEO) feels he/she is a major stakeholder and is demanding that the government start delivering the goods. Let us have a brief glance at the people's priorities.

Top Ten: Some of these are checking corruption, taming inflation, reviving the economy, boosting manufacture, agriculture, etc

Powerful: These include denationalisation of the coal sector, corporatisation of the railways, establishing a land bank, etc

Defence: Includes increase in the budget, streamlining acquisition procedures, boost in indigenous capability, etc.

External: These range from Indo-US relations to dealing with China and Pakistan to relations with neighbouring states, the Look East policy, etc.

This list is purely illustrative. The 'etc' at the end includes a myriad

others, equally vital. So the question is: how does a government deal with such a massive agenda? One way is to qualify them into essential, desirable and routine. Many of them will have to be tempered with political considerations. Some of them will be kept in abeyance. Some will be dictated by the emerging international scenario. Whatever be the disposal, one common thread runs through the entire process. They all have to be measured against a common time base. Time is of the essence chiefly because India is at the cusp of its political and economic power.

One aspect that has been conspicuous by its absence in official articulations is national strategy. Simply put, where we are and where we wish to be in the 20-40 years timeframe has not been given adequate thought in government quarters.

I am fairly sanguine that the Prime Minister (PM) and his Cabinet are more than seized of all the nuances. I shall attempt to put forward some of my views specifically related to the defence and security scenarios.

STRATEGIC DIRECTION

One aspect that has been conspicuous by its absence in official articulations is national strategy. Simply put, where we are and where we wish to be in the 20-40 years timeframe has not been given adequate thought in government quarters. I am sure someone must have articulated some thoughts, someone must have worked towards a formulation, at least some of our leaders must be familiar with it. How come, then, that almost all our endeavours, be it in foreign relations, arms acquisitions bills/ ordinances, internal security, or key appointments smack of ad-hocism? The lack of strategic direction ultimately contributes to a lack of national character and a lack of national will, two maladies we have been afflicted with for decades.

National strategy comprises many disciplines, which include defence, security, economy, agriculture, industry, diplomacy, foreign relations. Once national strategy is defined, debated, modified and enunciated, it defines the broad path to follow, regardless of who is in power. All

other strategies like military, economic, industrial, etc flow from it. The process of formulation must start now. A group of experts from as many fields as practical should be tasked to present the first draft in a time-bound period. Let it first be debated within the government and then publicly.The media must be taken on board at a predetermined time. Thereafter, we need to publish a White Paper for the benefit of the world so that others are also privy to our thinking. March 2015 could be the target date.

EFFECTIVE IMPLEMENTATION

We have laws, rules, regulations for every conceivable contingency. Our problem is implementation. Effective implementation involves every citizen, but more so, it is dealt with by the bureaucracy and the police.

The Police: Generations have either been entertained by the antics of policemen and women on celluloid, been contemptuous of them or fearful of them. This is partly a carryover from the colonial days when they were actively used to further the nefarious activities of the British rulers. In the 67 years after independence, their lot has not improved. What can one expect of a police force that is understaffed, underpaid, underhoused, misused and abused by the political masters? The common excuse given is that it is a state subject and the Centre can only make suggestions. If we want effective implementation, we have to immediately and earnestly improve their lot. Some suggestions are:

Amend the archaic Police Act. A long pending issue.

Improve pay scales, living and working conditions, and provide access to better technology and weapons. Insist on states' compliance.

Recruit to fill deficiencies.

Control of the police must be with police officers and not with politicians. This is a sensitive issue and this is where the wheels of progress get stuck. Unless we overcome this resistance, we condemn the police to continuing in the same state.

The Bureaucracy: The Nehruvian era saw the rise of the bureaucracy. In my opinion, they have to bear a share of responsibility for the poor

governance that ails our country today. Their rise was aided and abetted by indifferent ministers who preferred to let the bureaucrats run the ministries. The problem has always been a lack of accountability. The ministers were so overly dependent on them that they could not make demands on them or take them to task. Fortunately, the new government has made this its first priority and the results are already showing in both North and South Blocks, if the media are to be believed.

INTERNAL SECURITY

The dimensions of this challenge are staggering. At one end is the individual security of citizens, especially women. The other end of the spectrum comprises Naxals, the Northeast (NE) states, Article 370 and outfits like the Harkat-ul-Jihad-al Islami (HUJI) and Indian Mujahideen (IM). As far as individual security is concerned, policing is the only immediate answer. Reforms on this have already been discussed earlier. Let us address the others.

Naxals: The origin of the Naxal problem is attributable to socio–political and socio–economic repression. The poor and the Scheduled Castes were downtrodden by the Zamindars. Land reforms were negligible. Forest land was shrinking. Added to that, there was no development. In fact, governance was sorely lacking. At first, the states sought to control the problem through the state police forces. Most of the police forces were in a poor state. Numbers, infrastructure, weapons were minimal. They were swiftly rendered ineffective and the Para-Military Forces (PMFs) were called in. Meanwhile, the movement became more coordinated and stretched across state boundaries. As the Naxal movement snowballed, the PMFs were stymied. Some of the reasons for their underperformance are given below

The states jealously guarded their jurisdictions and frowned on any infringement by sister states. Since the problem stretched across state boundaries, continuity was a problem. The situation was like a balloon. If you applied pressure on one side, the other side would swell and the Naxals migrated to other states. There was no coordinated plan to counter the menace.

Different forces even with similar weapons and manpower tend to operate differently in anti-terrorist/insurgent situations. The difference comes in because of the leadership, command and control, the ethos of the organisation and the operational awareness. Presently, the Central Reserve Police Force (CRPF) is employed in company or platoon strength, often attached to the local police, with no specified area of operations. Inspectors are often in their 50s with insufficient knowledge of terrain or local conditions. Stamina and motivation are often not as high as would obtain in a younger, professional leadership cadre. The local police is used for intelligence. There is no coordinated intelligence grid and despite some efforts, no inter-state intelligence sharing. Even when invaluable intelligence is obtained, the reaction is slow due to a convoluted command chain.

A lot of money has been spent on acquiring new weapons and equipment. Training has not been commensurate. To illustrate this through an example, when the Indian Air Force's (IAF's) Remotely Piloted Aircraft(RPA) were deployed over Dantewada, we had accurate and timely intelligence on a large gathering of Naxals. The IAF had even trained the CRPF in slithering down from choppers since the roads were likely to be mined. The choppers were ready but the troops took a long time to assemble. Such fleeting targets do not remain in one place for a long time and the operation was a failure. The security of camps needs beefing up. Training standards must be raised, new weapons and equipment practised with. A communication grid needs to be established and soldiers trained in its use.

This paper is not meant to deal with how to tackle the Naxal menace. But the inevitable aftermath of massacres like Chintalnar is media hysteria. There is public outrage, and in trying to minimise the political damage, the political leadership comes out with all kinds of pacific statements. Then, an inevitable response is to induct the armed forces to kill the Naxals and wipe them out. This needs to be placed in perspective. The armed forces are India's armed forces. They are the people's forces and prepared to make the supreme sacrifice to protect the people and the country from external and internal threats. The armed forces are also aware of the need for civil control over the military. If they are called to step in to restore order due to

bad governance, then they are equal stakeholders in good governance also, being equal partners in the well-being and development of the country. They must make their views known to the people. Of course, the ethos of the armed forces is that once the government passes an order, it is their bounden duty to execute that order with all the commitment at their disposal.

A solution to the Naxal problem needs to include the socio–political and developmental aspects also and a pure military intervention will not be sufficient. It is going to take a long time to come to grips with this issue and, in my opinion, a short-term, quick fix solution, however attractive, must not be resorted to. Presently, the armed forces' participation is restricted to the army and the IAF. Let us have a look at some of the problems involved.

The army and the air force are meant to annihilate the enemy. The enemy is very clear and unambiguous. It operates on the principle of the maximum force in the minimum time. The concept of minimum force is very rarely applied. Whereas in a civil scenario, minimum force is paramount. The army has been operating alongside the PMFs in Jammu and Kashmir (J&K) for decades and has brought the terrorist activities under good control. But at what cost? Their conventional training has suffered. Their peace-to- field ratio has suffered, raising morale issues. Their weapons are for war, ill suited against terrorists. The moment they come in contact with the local constabulary, their character rubs off on the soldiers and causes disciplinary issues.

Insurgents are fleeting targets. Especially in the Naxal context, there is common ethnicity. Air weapons are fired from long ranges which precludes identification of minute targets. Therefore, 120 percent surety of target intelligence is mandatory to prevent fratricide. We do not yet possess this technology. Our intelligence has never achieved such accuracy. Uninformed people talk of dropping weapons through a window. Of course, the IAF has the capability to fire a weapon through a 2′ x 2′ window. But the payload is, let us say, 200 kg. When it explodes, it has a lethal radius of a 100 m. So whither collateral damage? We do not have 'lo- charge' or 'lo- lethal' weapons as yet for air-to-surface firing. However, such weapons are now emerging on the world stage.

Helicopters are a potent force in anti-Naxal/anti-terrorist operations. They can be, and are even now are being, used in a variety of vital roles. Some tasks are reconnaissance, surveillance, logistics, insertion/extraction of troops, casualty evacuation, air-drop/ resupply.

RPA or drones, at first glance, seem to provide the answer. They, however, have a lot of limitations. Firstly, they need to be parked carefully, protected from weather and strong winds. In flight, weather and clouding are major hazards. They are ineffective over jungle terrain except with certain payloads. They can detect and track, but cannot attack unless they are of the Unmanned Combat Aerial Vehicles (UCAVs) variety. Transit speeds are about 100 to 150 k/h and they are noisy. Modern RPA with Vertical/Short Take-Off and Landing (V/STOL) capabilities are in the offing and these would better deal with such operations.

Helicopters are a potent force in anti-Naxal/anti-terrorist operations. They can be, and are even now are being, used in a variety of vital roles. Some tasks are reconnaissance, surveillance, logistics, insertion/extraction of troops, casualty evacuation, air-drop/resupply. Helicopters are most vulnerable during the take-off and landing phases. In spite of armour, the air force has lost a gunner to Naxal ground fire because the helipad zone was not properly sanitised. The air force helicopters are in short supply. They provide logistics support to the army all the year round. Any pull-out is likely to increase the load on the others. So is the case with the numbers of crew.

It seems almost inevitable that in the not too distant future, the role of the armed forces in such insurgencies will increase. The first to be affected will be the army, covertly or overtly. However, all is not lost. This, too, can be managed. It will involve operations under a central planning agency involving all the stakeholders. The chain of command must be clear. Development and socio-political balm must be applied, synchronous with military operations. Synergy is the order of the day. Leadership, training, infrastructure, equipping are prerequisites to such endeavours. Some organisations may need restructuring and rejuvenating. In my opinion, it is likely to be an 'out'

to 'in' approach: forces operating out of a few well protected bases, conducting operations and returning to a safe home, first to stabilise the easier areas, secure them, and then act on the more difficult areas.

The central areas of the country may prove difficult to cordon off. In border areas like J&K, there is scope for a more offensive use of air power. RPA, in conjunction with special mission aircraft like the C-130 J and helicopters with Night Vision Devices (NVDs) give excellent results if the target area is well defined. In J&K, Red Zones can be implemented on the ground and used to stymie intrusions. Technology will need to be harnessed, especially in communications and imagery, to deliver the best results.

India's strategic perspectives are shaped by its history, geography, geo-political realities and the demands of realpolitik. Our native culture, our innate traditions of trust and tolerance, and our vision of world peace shape our national character, which, in turn, impacts our international relations.

NE States, HUJI, IM, etc: The NE states must be brought into the mainstream. They have contributed significantly to national wealth and have been ignored. Build-up of road/rail infrastructure should be a priority. I have clubbed organisations like HUJI to point out a salient difference. Naxals, Nagas are indigenous, rural. Their ire is against indigenous indifference, maltreatment or misgovernance. The *jihadi* organisations, on the other hand, project the agenda of external powers, with separation from the Union as their prime objective. So while one needs to be resolved by winning the hearts and minds, the other needs ruthless eradication.

J&K: A problem we have faced and fought over for decades, this is not likely to be resolved in the near future. However, it is equally vital for us not to forget that Kashmir is an integral part of our Union. I am of the opinion that Article 370 needs to be done away with. Obviously, it is too early to resolve this problem, but Article 370 must continue to be discussed openly at regular intervals so that the people become aware of all its nuances.

EXTERNAL SECURITY

India's strategic perspectives are shaped by its history, geography, geo-political realities and the demands of realpolitik. Our native culture, our innate traditions of trust and tolerance, and our vision of world peace shape our national character, which, in turn, impacts our international relations. These vital parameters are as relevant today as they have been earlier. India shares borders with 11 neighbours. Our relations with some are uneasy and with some, hostile. Any unrest within this somewhat hostile neighbourhood spills over into our borders in many forms; and with depressing regularity. Unless these geo-political cross-currents affecting us are quietened, they would continue to thwart our desire to move forward. Hence, the first priority becomes improving relations with our immediate neighbours. With a massive public mandate, the government needs to move decisively forward. The PM has already given indications of this by his visits to Bhutan and Nepal.

Among the neighbours, Pakistan remains an immediate concern. We do need to continue dialogue on our own terms but not by bending over backwards. Initiating military-to-military dialogue will be an out-of-the-box step, likely to pay dividends. It could be started at an innocuous level like medical, meteorological and sports exchanges, invitations to seminars, and, depending on how the situation develops, more dimensions can be added. **I**t is important that our politicians repose complete faith in our military. As a policy, we must insist on Pakistan stopping support to terrorism before dialogue can progress.

China is our major concern. We must engage China but from a position of strength. We have a window of 10 to 15 years in which to strengthen the NE in terms of infrastructure. Our missile reach must increase so that deterrence is achieved. Naval presence in the Indian Ocean must be more tangible. But these are long-term objectives. In the short-term, we must engage China in infrastructure and trade, and be patient. The Chinese think in terms of a thousand years and have long memories. Also, they set a lot of store by 'face'. Loss of face cannot be countenanced. This reduces the chances of major misadventures.

India's Look East policy was reenergised during the Manmohan regime. It seems likely that the new PM will also pursue this actively. Japan, Vietnam, Myanmar have a lot to offer us. In fact, presently our national interests also show a congruence in the face of the Chinese stance in the South China Sea. Australia, however, needs to be taken with a pinch of salt in view of its other alliances. I feel relations with the USA, Russia, EU, UK , Israel, the Arab world are on track and part of the long-term perspective.

National interest must reign supreme and regardless of the provocation, it must always dictate Ministry of External Affairs (MEA) actions. Though the frequency has now reduced, we have in the past taken the high moral ground, sometimes even at the cost of our national interests. I agree that the internal situation does colour our external relations, but at one stage, the MEA had achieved the impossible. We had poor relations with all our neighbours. This is something we have to correct immediately.

DEFENCE

The defence secretary is responsible for the defence of India. The army, navy and air force are attached offices to the Ministry of Defence (MoD). Here lies the defence conundrum. Perpetuated by the innate civil-military trust deficit since the Nehruvian era, no government has addressed this malaise over the last six decades. Events in neighbouring countries have strengthened the trust deficit. The result is that the armed forces of India have no say in the decision-making process; the security apparatus functions with minimal Services' inputs; civilian control over the military has been misinterpreted to ridiculous levels and bureaucrats rule the roost. The topic deserves an entire chapter. But, a few brief suggestions to the government are in order so that it may ameliorate some of the ill effects.

Integration: The MoD and the Services must be integrated and brought on par with the other ministries. Lip-service has been paid to this aspect many times. We may start at lower levels like director/colonel equivalent and gradually build up after stabilisation. It is necessary that the order terming Services Headquarters (HQ) as attached offices must be rescinded to make them a part of the decision-making process.

Budget and Procurement: The defence budget needs to be upped to at least 3 percent of the Gross Domestic Product (GDP). This has been pending for many years. The argument given is that even now there is unspent money at the end of the financial year. This is basically due to a few reasons. Firstly, it is sometimes done deliberately by Finance so that reallocation to other sectors can be done. Secondly, it is due to indifference at the bureaucratic level because they have no accountability. Lastly, it happens due to inherent delays in the Defence Procurement Procedure (DPP). This came into vogue in 2006 and has been refined to its optimum. We need to take a new look at it to simplify it and make it more effective.

Middlemen: All corruption in defence deals is attributed to this species. Time and again, the media throws up names and the damage to the exchequer. We must understand that there is no country in the world where foreign companies operate without middlemen. They may be termed agents or facilitators or liaison people. In India, the rules of business are so complex that our own companies would find it difficult to prosecute business without liaison, not to talk of foreign firms. The government had tried to register the names of middlemen a decade ago. The terms and conditions were so onerous and intrusive that, naturally, none came forward. We need to permit middlemen, register them and ensure they pay their taxes for what they receive. This will achieve transparency and, in fact, reduce corruption. A common belief is that this is one of the ways to enhance political party funding, and hence, the reluctance to permit middlemen.

Indigenisation is a crying need since we are one of the biggest importers of arms in the world. Indigenisation cannot happen overnight. We have to create conditions for it to happen. Over the next ten years, we are likely to spend $230 billion on defence. At 30 percent offsets, the figure comes to a staggering amount. Can our industry handle such offsets? Does our private sector have the strength and capacity to absorb such amounts? We need to simplify our rules to enable the private sector to participate. Perhaps increasing Foreign Direct Investment (FDI) in defence from the present 27 percent to 60 or 75 percent may be the answer, but it needs detailed examination. There are two things we need to set in motion

at the earliest. First is a reorganisation of the Defence Research and Development Organisation (DRDO) and Ordnance Factories (OFs) to make them accountable and efficient. The second is a restructuring of Hindustan Aeronautics Limited (HAL), our biggest Public Sector Undertaking (PSU) to make it more capable. The results will be visible in three to four years and gradually we would move towards greater indigenisation.

Pending Issues: I have clubbed together some issues that should be addressed early. One Rank One Pension(OROP) is an issue affecting the morale of thousands of veterans and needs resolution. Secondly, the 7th Pay Commission, like its predecessors, has no representative of the Services**.** This should be remedied. Thirdly, a vast country like ours whose soldiers have fought so many wars, does not have a National War Memorial. This is a national shame and needs to be put right.

CDS: Any discussion on defence reforms is incomplete without reference to a Chief of Defence Staff (CDS). Many acknowledged experts feel that this is the panacea that will set right everything. They are even ready to accept a purely cosmetic appointment of a permanent Chairman of the Chiefs of Staff Committee (COSC). My views are certainly different.

Different countries have different formulations of CDS. In some, the CDS looks after operations and the three chiefs, the forces. Others have the CDS in charge of training, provisioning, logistics, and intelligence. In some countries, he looks after budgeting and procurement. We need to decide what type of CDS is most suitable for us. Joint operations doctrine naturally flows down to Theatre Commands. This is effective when you envisage regular operations away from the homeland. We do not envisage such operations. Exigencies can be dealt with by special joint operations.

Joint operations need technology which enables the commander to control remote areas of influence. We do not have such technology. We have not laid sufficient stress on jointness in career progression. That means only those who have served on joint billets can be promoted beyond a certain level. Though a CDS is a must, first, we need to decide on the type of CDS we need. We need to start grooming personnel for joint operations and

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we need to start developing the necessary technology. The need of the hour is that the army requires tanks, howitzers, ammunition. The navy needs ships, submarines, torpedoes, missiles. The air force needs aircraft, missiles, radars. Let us complete ongoing contracts to restore and refurbish our fighting forces first before restructuring them.

So, on the CDS, let us start the debate and simultaneously develop technology. In three to five years, let the CDS look after budgeting and acquisitions for all the Services, besides Joint Commands, strategic weapons, intelligence. Most importantly, he needs to be the single point of military advice to the Raksha Mantri (RM) and the Prime Minister (PM). We should think of a parallel approach, with the defence secretary dealing with inter-ministry issues and the CDS with military issues. Will the government accept so much power vested in one military person? Will the bureaucracy permit such trespass on its traditional turf? These are questions we have to answer first.

CONCLUSION

Indians do not have a national character. We do not have a national religion. We are not agreed upon a national language. We do not understand national interest. We do have national pride. We do not have a Brand India. We were ruled by foreigners for thousands of years and the scars manifest themselves in our behaviour. We got our independence with very little bloodshed thanks to the struggles of a few great men and women. So not everyone has felt the pain. We got democracy before literacy. Hence, we undervalue it. We are not responsible citizens and we do not take our duties and responsibilities as citizens seriously. It boggles the imagination that despite these impediments, we have continued as a successful democracy for more than 60 years. We are deeply emotional. Once we take someone

to our heart, we raise him to the highest pedestal, a demi-God. We can also drop him as easily, with no second thought.

The public manifestation of faith in the new government is the massive mandate given to it in the recent elections. Every Indian expects it to set things right. Time is at a premium. It has taken over the reins of governance at a time when India's stock is low in the world in terms of credit rating. The world economy is in a slowdown mode. El Nino has delayed the monsoon. The war in Iraq has affected oil. Prices of common goods are rising. The government has thousands of priorities in front of it and it knows that, finally, hard, unpalatable decisions will have to be taken.

This paper has sought to put some priorities, especially in the defence and security sectors, on paper. I am sure the government is aware of most of them. All priorities will have to measure up against a time graph. Some have to be done now. Some have to be started now for the effect to be felt later. Some will have to be sounded out against the political sounding board or the international environment. Some will have to be abandoned after a cost benefit analysis, to be tried out at a more propitious time.

Whatever be the method, it has to be a combined effort. Not only the government but the opposition too has to contribute to issues dealing with national interests. The whole country will have to learn to tighten its belt for some tough measures. We citizens will have to exert the national will to overcome the ills of corruption, delayed decisions and lack of governance. Remember, there is no magic wand. We have to be patient. We have to give the government sufficient time. I have no doubts that if each one of us exercises more discipline, does his own job sincerely and keeps national interest in mind, the good days will come and India will once again take its rightful place in the new world order.

ATTACK HELICOPTERS: WHERE DO WE USE THEM? WHO SHOULD USE THEM AND FOR WHAT?

A.G. BEWOOR

INTRODUCTION

One major acquisition planned for the armed forces is the Attack Helicopter (AH), which some reports say would become an integral part of the strike corps of the Indian Army under the direct control of the corps commanders. This needs a review because the AH has not proved to be the panacea for victory, or, as projected from time to time, a game changer and force multiplier. All ground force commanders always want dedicated airborne firepower under command and only for their troops, to give critical support for either the 'breakout' or to thwart enemy attacks. The corps / division commanders who have integral armour, artillery, combat engineers, signals and services, now also want airborne offensive capability. These mobile formation commanders with numerous Infantry Combat Vehicles / Armoured Fighting Vehicles / Self-Propelled Artillery (ICVs/AFVs/ SPA) want equally fluid airborne fire support under command for their plans to succeed, and the only source for that airborne firepower is the AH. However, there is an inbuilt lacuna which militates against a cardinal Principle of War, that of Flexibility, because of the AH being restricted within

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The creation of these large fighting formations was alien to Indian thinking till the late 1970s, simply because the doctrine of India was not to invade another nation to acquire territory; it was always a defensive policy wherein *attack* was an integral element. In the aftermath of our victory in Bangladesh, military thinking had to change.

a small space of just 100 km by 120 km. Much has been written and much withheld, about the feasibility and practicability of implementing the plans of these strike formations as revealed during Operation Parakram.

HOW WAS THIS CONCEPT ACTUALLY GOING TO WORK?

A Recapitulation of that Era

The creation of these large fighting formations was alien to Indian thinking till the late 1970s, simply because the doctrine of India was not to invade another nation to acquire territory; it was always a defensive policy wherein *attack* was an integral element. In the aftermath of our victory in Bangladesh, military thinking had to change and new ideas had to emerge if the Indian military machine was to remain a reckonable force. By the mid-1980s, the Indian Air Force (IAF) had got the Mirage, AN-32, IL-76 and MiG-29 aircraft. The insurgency in Punjab was hurting us and troubles in Jammu and Kashmir (J&K) were just beginning. On this scene came the ideas of extremely mobile, very potent and flexible mechanised ground forces which would radically change the concept of war in the Indian subcontinent. Though the concept's success was disputable, it was progressed vigorously. Enormous exercises were conducted to test the theories and philosophies; and their declared conclusions are being questioned even today. Readers should know that such a corps in those heady days would number close to 100,000 men with about 220 AFVs supported by some 100 ICVs. The command and control structure for such a potent formation constantly on the move comprised very complex and expensive infrastructure. The inherent weakness in the concept, as accepted by many knowledgeable army strategists was the staggering number of personnel and vehicles

that had to be kept track of, manoeuvred, replenished, rearmed, and fed, which made the chances of success highly refutable. A pertinent question then is: how did this idea enter the minds of our strategists and visionaries?

Strike formations with terrific mobility became the bedrock of the fighting concepts in India's western theatre. Many actually believed that such bold plans would succeed and they conducted major exercises with very telling lessons not widely publicised because many concepts did not get validated.

Doctrines from Overseas Institutes

During the late 1970s and the 1980s, the Indian armed forces' strategists got exposed to American and North Atlantic Treaty Organisation (NATO) doctrines of warfare. In Europe, NATO's strategy was to thwart the 'Russian Steamroller' since they had psyched themselves into believing that the Soviets would invade Western Europe. Recall that NATO's plan was always to blunt the offensive from the east, never to capture territory and liberate the countries of Eastern Europe. The AH was a part of those forces, but could never be tested in Europe under battle conditions. However, this doctrine appealed to our army strategists of that era. Strike formations with terrific mobility became the bedrock of the fighting concepts in India's western theatre. Many actually believed that such bold plans would succeed and they conducted major exercises with very telling lessons not widely publicised because many concepts did not get validated. Regrettably, the Indian facsimile of NATO was created not for foiling an enemy offensive but for just the opposite: to surgically and swiftly slice through enemy defences with overwhelming firepower from the AH in close support, to capture, and then hold, that enemy ground. The AH became indispensable for this aim, which, as will become abundantly clear, was in violation of the very First Principle of War, Selection and Maintenance of Aim. The flaw was in the selection not in the maintenance. But the pertinent question that must arise is, how much ground was expected to be taken, and having captured enemy ground, then what? So let's see where and

how the AH can be successfully used for the military campaigns of the Indian armed forces.

WHERE HAS THE ATTACK HELICOPTER BEEN DECISIVE?

Look at Europe and NATO?

In Europe, how would NATO mechanised formations, outmanoeuvring each other, reorganising to counter enemy thrusts, keep their helicopters with them? How would the AFVs / ICVs recognise ***our AHs from theirs***? More pertinent, how will our AH pilots distinguish *friend from foe*? What happens with regrouping, reversals and retreats? What is the impact on the morale of own forces when our AHs are destroyed among manoeuvring AFVs and ICVs? Not for a moment should one equate the destruction of a tank, ICVs or truck with the felling of an airborne helicopter that crashes down in flames from the skies, to be seen by combatants on both sides. The downing of a flying machine by ordinary soldiers, visible to hundreds, evinces unmitigated jubilation or utter remorse depending on which side you are on. The fog of war gets even more blurred with AHs manoeuvring, throwing up dust and sand, their howling engines adding to the noise and chaos. All this cannot be wished away, though many have ignored it. Recall that with contemporary technology during Desert Storm, the utility of the AH was never the acclaimed by any Western Army. At one end of the technology spectrum, there was the Joint Survellance and Target Attack Radar System (JSTARS) and Airborne Warning and Control System (AWACS), and, at the other end, allied aircraft attacked their own ground forces. The density of AFVs/ICVs during Desert Storm was thinner than what was envisioned in Europe: fixed-wing ground attack aircraft flew in close support of land forces, AHs were sticking close to their mechanised formations, logistic and casualty evacuation helicopters were flying in and out of the battle zone, and AWACS controlled all the flying machines. The control structure was mind boggling and only the USA managed it with difficulty; we will come later to our command and control accoutrements. Even today, 25 years after Desert Storm, India does not have a secure

electronic communication-command-control environment to manage so complex a fighting formation. Readers must go back in time to the late 1980s and early 1990s when India was creating and honing the strike formations and NATO actually used them in Iraq. By the time Desert Storm ended, it was abundantly evident that the AH was of little value and extremely vulnerable to small arms. Sadly, as we now know, this fact seems to have been quietly ignored in India by both military and civilian strategists

In Afghanistan and the Middle East

The Afghan terrain saw the Soviets and Americans try out their AHs with bad results against a poorly endowed enemy with a weak doctrine and training. Our adversary is well trained and fights courageously. These truths need reiteration because had we in India brainstormed and war-gamed the utility, attrition and success of the AH in the Indian scenario, the conclusions would have ruled out, and turned down, the AH for close dedicated support to land formations in any environment. The Israelis found nothing great about the AH during their Lebanese and Gaza skirmishes and use only fixed-wing aircraft outside their air space. Witness the recent Israel–Hamas conflict in 2014 for air attacks in Gaza: invariably a fixed-wing aircraft, never helicopters. Observe the use of only fixed-wing aircraft against the Islamic State forces in North Iraq and Syria, not AHs. **Surely, there is a lesson for India**. In their Afghan misadventure, Soviet AHs were destroyed even by wire-guided anti-tank missiles which did not attract the serious attention it deserved in India. Recall the humiliation meted out to the crew of the American helicopter destroyed in Mogadishu. Can we ignore the over 5,000 helicopters lost in Vietnam, and against what type of weapons and enemy? That is how vulnerable the AH is. It is slow moving, easy to destroy during hover, and the greatest aerodynamic capability of the helicopter is hovering, a disadvantage in close quarter battles. To make intellectual inquiries about the advantages of the AH is wishing away the truth staring us in the face, but let's look at India's geography before rejecting the AH for close support under the direct control of the ground force commander.

INDIA'S BORDERS ARE ALSO IN THE MOUNTAINS

In Ladakh and Arunachal

It is here that the AH will face its severest test and will fail. Trials are repeated, reappraised, judged, and reevaluated to squeeze some positive outcome, but to no avail. Readers will be amazed to know that the very first proposal for the AH was for the defence of Bhutan, which as we shall see, was incorrect. Recall the recent imbroglio about VVIP helicopters and the questions about their performance at high altitudes. In the very same vein, let's look at the AH with altitude as the overriding factor. Our long border in the mountains precludes the use of the AH or any helicopter in the offensive role. There are many reasons, stated later; suffice it to say, the AHs are wasteful and, indeed, futile machines in the mountains, and since India has thousands of miles of mountainous borders to defend, the AHs with the army, air force, Border Security Force? (BSF), Indo-Tibet Border Police (ITBP), Research and Analysis Wing (R&AW), Border Roads Organisation (BRO), comprise a zero force multiplier and cannot be a game changer. Regrettably, many ignore this truth, insisting that the AHs are the nostrum for victory. The air force advises against their acquisition and placing them, if acquired, under the army. The officials in the Ministry of Defence (MoD), Ministry of Finance (MoF), Ministry of Home (MoH), Ministry of Defence Production are confused by these cross-demands, resulting in retarded weapon procurements. Routine acquisitions get sidelined, and, finally, when hostilities commence, an army chief declares, *" We will fight with whatever we have"*. Do the proponents demanding AH carefully deliberate on whether it will be useful, is flight safety compromised, can the AH take care of itself, and then factor these inputs on the morale of the fighting formations who, in any case, know the truth? Frontline units, both ground-based and those who will fly the AH, are aware of the injudicious insistence by higher formations to acquire weapons that will not deliver the punch when the battle is joined. And now we have created a mountain strike corps where the demand for the AH will multiply exponentially while we are fully aware of the AH having no offensive use in the mountains. Having

read so far, it would be self-evident that the AH is incapable of doing what we think it can, but please read on to understand why.

The Heights of the Himalayas

All aero-engine power degrades with increasing altitude including the engines of the AH. Thrust output from jet engines decays by 10,000 ft, and the colour of neither the pilot's uniform, nor that of his commanding officer nor that of his general or air marshal, can change this. At 17,000 ft, where our AHs will mostly operate, the thrust decreases faster because gravity keeps more than 50 percent of atmospheric molecules below 15,000 ft. Finally at 20,000 ft, where our AHs will operate to deliver weapons, there is less than 50 percent oxygen compared to sea level, thus, 50 percent thrust. This is an inviolable verity of physics. The army and air force pilots know this truth. Helicopter pilots operating in Siachin, Arunachal, Ladakh and Uttarakhand experience this phenomenon every day and know the perils of limited thrust. And when the AH has to hover, the absence of power is even more accentuated because there is no forward velocity to alleviate reduced power output. Many fatal accidents are directly attributable to the pilot himself or his superior forcing him to ignore and disregard this aeronautical fact. It would not be out of place to remind readers about the Pakistan Air Force (PAF) Chief, Mushaf Ali Mir, killed in an air crash in February 2003 while flying near Kohat. What basic rules were ignored that caused this tragic accident of the chief of a professional air force? If, as we now know, the AHs cannot perform at desired levels let alone peak levels above 12,000 ft, where the army most needs them, why procure them? The question has remained unanswered for far too long. Many army strategists opine why they must have their own aviation arm, and accuse the air force of being obdurate, stubbornly obstructing the army from procuring AHs. The author understands the frustrations of the army, but humbly adds that this obstinacy by the Indian Air Force has saved India precious foreign exchange by rejecting a weapon that has little use in any sector where India may engage in war. Let us now enter the contemporary world and look at recent happenings as further proof of the inutility of the AHs. What

AHs are useless in the mountains because high altitude severely drains the power of aero-engines with greater deleterious impact in the hover; is it not ironic that this unparalleled capability of the AH, the hover, is hit worst in the mountains?

actions could our AHs have taken during the many face-offs we have been having with the Chinese in both Ladakh and Arunachal? Would the AHs have fired weapons? Could they have fired weapons? Would the Chinese have reacted violently against our AHs? If that possibility existed, how would the AHs have reacted? Can one use AHs against infantry which is what the Chinese use for transgressing the borders? Answers to such pertinent questions will precipitate into one conclusion: the AHs would just fly around and remain out of the range of Chinese small arms. The helicopters we have can already do that, why do we need AHs? Later in this story we will see the actual deployment of the Mi-35 during the battle of Kargil. We have now established beyond doubt that AHs are useless in the mountains because high altitude severely drains the power of aero-engines with greater deleterious impact in the hover; is it not ironic that this unparalleled capability of the AH, the hover, is hit worst in the mountains? Extraneous factors cannot be conjured from staff papers to overcome the severe limitations of altitude on the performance of the AH. Now onto the plains of India.

GAZA, GOLAN, PUNJAB, RAJASTHAN

Gaza and Golan Heights and Our Plains

It is true that the Israeli Air Force deploys AHs working in conjunction with Unarmed Aerial Vehicles (UAVs) and Remotely Piloted Vehicles (RPVs) to attack specific targets like VIP cars, buildings, and hideouts in Gaza, Lebanon, Golan. There is no opposition to these AHs which remain within Israel, firing their lethal weapons with precision guidance. It is pertinent that the Israelis do not use their AHs in close support of armoured formations sweeping across the Negev, assaulting Golan, razing Gaza or Lebanon. They know it would attract heavy attrition to even small arms.

What about the Indian AHs in Punjab and Rajasthan? Our adversary is better equipped and trained than Israel's adversaries. Our gigantic strike formations were expected to slice through enemy defence with the AHs in tow and then actually hold ground. Could they actually do that? Observe the swiftness with which the air attacks by the USA in north Iraq are beamed into our living rooms. Will India be permitted to do such a thing? Will the nuclear equation between Pakistan and India permit this? India's stated policy has never been to capture another nation's lands, but strike corps plans are just the opposite, and to add to this contradiction, defence training institutes know that such plans are intrinsically flawed. Readers must note that these **offensive plans depend on the success of the AHs and cannot be progressed without full sustained support from the AHs.** Observe Voltaire's warning, "*It is not inequality which is the real misfortune, it is dependence.*" But as we have just seen, the AHs cannot be utilised as envisaged and will suffer unsustainable attrition. Then, the AHs will have to withdraw, and in that circumstance, the land battle will not succeed. Yet persevering with acquisition of AHs is nothing more than a classic case of '*situating the appreciation*', or as happens often, writing the conclusion before penning the heading and aim of a staff paper.

The AH has failed twice in Iraq, continues to fail in Afghanistan and the Frontier region of Pakistan; helicopter casualties in Vietnam were horrendous as were Soviet helicopter losses in Afghanistan. The plains of Punjab and the deserts of Rajasthan will become the killing ground for the Indian AHs.

Into the Killing Ground?

If today the land forces cannot pursue their grandiose plans of going kilometres deep into enemy territory, then the demand for AHs ceases to exist. Because even in the classic defensive battle, the very same limitations that prevented the deployment of AHs during attack, will apply. The terrain is the same, the forces are the same, the enemy is the same, the AH will still fly low and have to hover, and its vulnerability remains the

same. Why then are we persisting with a doctrine not designed for India and discarded by so many other nations? The AH has failed twice in Iraq, continues to fail in Afghanistan and the Frontier region of Pakistan; helicopter casualties in Vietnam were horrendous as were Soviet helicopter losses in Afghanistan. The plains of Punjab and the deserts of Rajasthan will become the killing ground for the Indian AHs which will be floating around within small geographical boundaries under the direct command of the division/corps commanders. This limiting of AHs within a space of just some cubic kilometres violates any number of Principles of War. And what happens when the killing starts, and they have to withdraw, just as we did with the MI-17 in Kargil? Will the corps commander fight without them? Are we buying extremely expensive flying machines, knowing their limited utility in the plains, zero capability in the mountains and high vulnerability everywhere? What or who is forcing this decision upon military strategists and visionaries? In all fairness to India, this has to stop. We know that tanks have to close up to 500 m before they can identify and engage enemy armour, and the AHs will be right there, often hovering, making themselves extremely vulnerable to Surface-to-Air Missiles (SAMs), Medium Machine Guns (MMGs), Rocket Propelled Grenades (RPGs), and small arms. We are putting our own AHs into a killing envelope without ascertaining the payoff in assured success of the land battle. Does this not appear to be replication of the Gallipoli, Charge of the Light Brigade, Dieppe landings, allied air drop on Crete, amphibious assault at Cox's Bazaar, Thagla Ridge, and so many similar operations where the chances of success were known to be poor, without strategic gain, and the planners persisted on the wrong path. It is time to learn our lessons, is it not? Having made a strategic error 20 years ago, we can, and must, backtrack to remedy that error.

LEADERSHIP, VISION, BASIC SAFETY AND UNDER COMMAND

Whither Leadership and Vision?

To quote Napoleon, **"In War it is the Man who counts, not the Men"**. Taking care of one's turf, boosting promotion opportunities, adding flavour

to units and formations, is indeed the job of senior military commanders, and necessary for morale and extolling military capabilities. But at what cost? If indeed the AH has negligible value, how will its acquisition be justified to future generations? Here is a true story that emerged from the Kargil battle. An AH was demanded by the army to attack some *intruders who had captured certain peaks in the Kargil sector* [as told to the Air Officer Commanding (AOC) J&K in Udhampur]. The Mi-35, heavy with its armour plating, does not have the engine power to cross Zoji La and the AOC explained that the Mi-35 could not get to Kargil to attack the intruders. A truck, Jonga or Gypsy, with reduced power at altitudes is manageable at lower speeds; the vehicle does not fall off the road. This equation was translated to the AH. The design of any AH, including the Mi-35, with heavy armour plating, makes it incapable of crossing Zoji La, whether piloted by an air force or army or navy or even civilian pilot. Unfortunately, these truths were misrepresented in the media with undesirable falsehoods about what actually could or could not be been done by the Mi-35.

So did the AH Finally Cross Zoji La?

Even today, after 15 years, this misleading fabrication remains an irritant between the army and IAF though the truth is well known. And, which is why the army is strongly bidding for the AHs to be placed under them so that their very own AHs will be flown by their own pilots in support of their own troops. The nagging question remains: how will the army's AH with army pilots and its armour plating, cross Zoji La, Rohtang, Khardung La, Baralacha La and other high passes to get to the battle zones of Ladakh? It cannot, and, thus, the inclusion of AH in the Order of Battle (ORBAT) of mountain corps/divisions for providing close support must be discarded. How will they make the helicopter lighter so that the engine can take the machine across a 15,000 ft pass with adequate safety margins—will they remove the heavy armour plating? Yes, indeed, that is exactly what the IAF did, removed the armour plating of the Mi-35 and it crossed Zoji La, but with little armament. Thus, it begs the question: is the AH of the army to do battle in the mountains defenceless, without armour plating, and with

limited armament? Putting the AH under the Indian Army cannot make it a better fighting machine than the AH which is with the IAF. Helicopters remain useless offensive firepower platforms in the mountains; it makes no difference to the AH whether the senior commander is a general an air marshal, inspector general of the Border Security Force (BSF) or an admiral for that matter.

Under Command Syndrome

The persistent desire of army commanders to have everything "under command" is a flawed concept when talking about the AH, or any airborne weapon system. Many senior army commanders have even expressed opinions that fixed-wing ground attack aircraft dedicated for Close Air Support (CAS) should justifiably be placed "under command" of the land forces commander for whose troops the CAS is being provided. Restricting the AH within a cube which is determined by the geographical limits of the land forces commander's territory is bad enough. But to put fixed-wing CAS aircraft within that cube is patently unprofessional. How can anyone want to restrict an airborne weapon system in a space far smaller that its radius of action? Would it be acceptable to limit T-90 tanks to just 40 percent of their range? Would it be acceptable to limit artillery to just 50 percent of their range? And all because the commanders' area of responsibility is smaller than the range of the tanks and guns? If such limits are unacceptable for ground-based weapons, they cannot be acceptable for airborne weapons, given their natural flexibility and manoeuvrability.

Army Aviation

Most certainly, the army must have airborne artillery observation posts to direct accurate gunfire, the senior officers need their own helicopters to swiftly move within their area of responsibility. However in creating army aviation, a lot of duplication and parallel assets with separate logistic channels have been created. All three Services use the Cheetah/Chetak, and the navy and IAF use Dorniers, yet each has to maintain its own pool of spares and rotables, with each Service supplied by the very same Hindustan

Aeronautical Limited (HAL). All army aviation helicopters have been moved out from air force bases and duplicate heliports with hangars and servicing facilities have had to be erected, at a cost of crores of rupees. But that is a different tale and we digress from the AH.

Infrastructure for AHs

Procuring AHs from a foreign supplier, overseas negotiating visits and training are really the easiest part of integrating AHs into the land forces command and control network. There is much more that has to be created, tested, modified, and, finally, checked under the severest of conditions. The author cannot quote from a better source than "Doctrinal Integration of Attack Helicopter Operations' by Col Deshpande, published in the *USI Journal* of April – June 2014, and a winner of the Chief of the Air Staff (COAS) Gold Medal. The article has its roots in the strike corps concept with the AH, and it also talks about the new mountain strike corps. The vulnerability of the AH is absent in that article which is irrelevant as that fact stands proven. But the article does talk of "a family of helicopters" which will be part and parcel of Composite Aviation Brigades (CAB). The CAB will include the Light Utility Helicopter (LUH), Tactical Battle Support Helicopter (TBSH), Light Combat Helicopter (LCH) and, of course, the AH, with all these airborne assets being *"orbatted"* to what is called a pivot corps. Observe the vast array of rotary-wing machines to be integrated into the CAB, which pre-supposes the continued existence and deployment of strike corps whose tasks and roles have been revised in the new subcontinental scenario. The article further adds that each corps will have one CAB which precipitates into at least three to four CABs in India. Imagine the cost and quantity of assets to create these CABs. And for what? To strike deep and hold enemy territory, which is contrary to declared policy, and highly debatable in the existing nuclear equation. Witness the hullabaloo because the Pakistan high commissioner talked to the Hurriyat. Imagine the international reaction, when Indian armed forces declare their capacity to overwhelm and capture enemy territory with two strike corps supported by their CABs? The USI article also talks about the need for multiple communication networks

In the struggle to acquire AHs, the one aspect given the go-by has been the utility of the UAV and RPV, both used extensively and rather successfully by the USA. Weigh, if you will, the cost, the inventories, the manpower, the technologies, and the support systems necessary for maintaining the AHs and other rotary-wing machines to support those strike corps.

with data links and redundancy within the army and between the army and air force to control all the flying machines that comprise huge investments with enormous recurring costs. The AH keeps getting referred to as a force multiplier which sadly it is not. Because to be a force multiplier, the AH will have to be constantly available, without unacceptable attrition and we are fully aware that high attrition is on the cards given the long history of AH and other helicopter losses during and since the Vietnam War. It is specifically pertinent to add that the latest communication networks of the army and air force are not integrated with each other as a policy. The article also deals with integration of UAVs and RPVs being used along with all the other rotary-wing machines of the CAB. Which brings us to the issue of AH or UAV. To decide what to add into India's arsenal of weapons needs knowledge and wisdom too: for example, *knowledge is knowing that the tomato is a fruit, wisdom is knowing not to add it to the fruit salad.*

SHOULD WE GET MORE ARMED HELICOPTERS ?

In the struggle to acquire AHs, the one aspect given the go-by has been the utility of the UAV and RPV, both used extensively and rather successfully by the USA. Weigh, if you will, the cost, the inventories, the manpower, the technologies, and the support systems necessary for maintaining the AHs and other rotary-wing machines to support those strike corps. The numbers are staggering and in all probability, such funds will not be released in the near future, given India's economic health and the direction in which the nation must move. Defence is critical, but we cannot overstretch ourselves for an offensive concept that

has lost its relevance. The author wants to place before readers some similar unexecutable plans like getting the AH and CAB and, finally, an independent air arm, wearing olive green only. He was closely involved in them. Recall the hierarchy and think-tanks of that era that produced the concept of huge sweeping mobile forces. Recollect the exercises, on both land and sea, for revalidating staff papers and sand model war-games. It was during this time that a plan of dropping paratroopers across Siachin was mooted. Yes, the mood then was such, and many young readers today may not fully appreciate the gung-ho temper of that era. How such a para-drop would be executed was never war-gamed. How the troops would get oxygen at 25,000 ft, the drop height, for more than 10 minutes under depressurised conditions, was unanswered. How many soldiers would be fit to fight after falling on steep mountain slopes was not factored in. Mercifully, we did not attempt the drop. Another plan was to recapture Trincomalle airport with a para-drop if the Liberation Tigers of Tamil Eelan (LTTE) had taken it. Trinco airport has a lagoon on three sides, a tall rice mill building next to the runway, high derricks, and obstructions in and around the runway. More than 80 percent of the troops would have gone into the water. Once again, abandoned, because the LTTE never wanted to take Trinco airport anyway. But such was the mood when the strike corps was being tested, honed, and the General Services Qualitative Requirement (GSQR) for AH was being generated. The very same group of 'visionaries' insisted in putting two squadrons of T-72s into Leh to fight in the badlands near Pangong Tso ahead of Darbuk. No 44 Squadron inducted 30 AFVs into Leh from Agra over 15 consecutive days without a break, so that before a particular

The use of the UAV / RPV is universally accepted as the least susceptible to interception and destruction. The infrastructure to create large units of such UAVs is insignificant compared to that for CABs or AHs. Manpower is safe from enemy action, destroyed UAVs have insignificant impact on morale, they are cheaper than the AH and pilot combination.

individual retired, the T-72s would be in location. Sadly, those tanks were of no value at Pangong and were flown back two years later. It is inconceivable that these planners did not visualise the uselessness of the T-72 in Leh and beyond Darbuk. That vision now needs to blossom into pragmatism and infuse maturity into many such unwieldy ideas, one being the acquisition of AHs under the command and control of corps commanders.

UAV / RPV

The use of the UAV / RPV is universally accepted as the least susceptible to interception and destruction. The infrastructure to create large units of such UAVs is insignificant compared to that for CABs or AHs. Manpower is safe from enemy action, destroyed UAVs have insignificant impact on morale, they are cheaper than the AH and pilot combination, complex communication networks are dispensed with, replacements are easily injected into the battle, weapon delivery onto enemy targets can be done remotely, and all this can be fully automated. The advantages of RPVs / UAVs in preference to AHs in the close support role are many, and indeed these advantages are enough to tilt the balance in favour of the unmanned vehicle. An unbiased appreciation without rancour must deduce that the AHs can be replaced by the UAVs/RPVs. It must be recalled that the definitive destructive firepower expected from the AH is not assured because of the extreme vulnerability of the AH. Then, the huge initial and recurring investment necessary to acquire, maintain and integrate the AH into the command and control network when weighed against its ability to destroy enemy armour again tells us that it is not a win-win situation. Then why pursue it when everything says, don't do it? However, let the decision to integrate RPVs / UAVs into the offensive firepower of the corps / division be discussed elsewhere and let us return to the best use of the AH. The idea here is not to promote the UAV, but to decide what needs to be done with India's AH fleet and how many more AHs should we acquire and where should they be located and under which system should they function?

There is Indeed a Very Special Niche Utility for the AH

What can be done with the AHs already with the IAF? What will they do if not support huge mechanised army formations? Contrary to scepticism, there are indeed very specific tasks that only a flying machine like the AH can do, and those tasks are best performed by those whose sole persuasion is flying helicopters and not as a stop-gap deviation from their original career path. The AH is best used for special operations where stealth, surprise, limited opposition and cover of darkness reduces its vulnerability. Our ability to intercept and attack Pakistani infiltrators from the air who escape from hamlets/villages after being attacked on the ground, is lacking, and the AHs can do this swiftly and efficiently. The AHs can be used to insert troops in the escape route of the terrorists as well as bring fire onto them, far away from civilian populations. We have wanted to target terrorist ingress routes into India when the actual infiltration is happening: the AHs can do that by day and night. We want to intercept Naxals as they roam freely, unseen by the ground-based Central Reserve Police Force / Border Security Force (CRPF/BSF). The inherent flexibility and speed that the AH can inject into such operations is invaluable. The AH will not be involved in a fire-fight with the Naxals or infiltrators, making itself vulnerable to their weapons, but will use its weapons as a deterrent and morale bruiser, causing great confusion among them. There will be no massed AFVs/ICVs targeting the AH, no elaborate communication infrastructure required to integrate the AH with the Rashtriya Rifles (RR) or CRPF. Used with imagination and not as a *'killer of our own people'*, the AH can become the fulcrum of destroying the hideouts and escape routes of the Naxals. We may wish to sanitise an area from aerial or surface intervention, like bridges/dams/buildings, ports, vital points, Republic/Independence/Army/Navy/IAF Day parades, sports stadiums and oil rigs. Another example is religious processions/gatherings like the Amarnath Yatra, Puri Chariot Yatra, massed prayers on Eid, Ramlila gatherings, large public protests like we saw with Anna Hazare/Kejriwal. Deploying the AH for surveillance and, where necessary, interception, is truly its classic role. It may be recalled that helicopter reconnaissance by the unarmed Chetak is being done during

many such events. For the tasks mentioned and many more that will emerge from the Ministry of Defence, Ministry of Home Affairs, Special Protection Group, National Security Guards, Prime Minister's Office (MoD, MHA, SPG, NSG, PMO) and Defence Headquarters (HQ), India needs no more than 40 AHs, distributed around India, keeping their range, maintenance and operational sector as defining parameters.

What about the Army and Navy?

From the foregoing, it is abundantly evident that the AH is incapable of supporting a land or sea battle where it will have to expose itself to well trained and, indeed, well armed adversaries with lethal shoulder-fired weapons, SAMs, and other small arms. It is a fallacy to believe that heli-borne special naval commandos can capture a ship on the high seas, as is often shown in Hollywood movies. Knowledgeable sailors are aware of this. Use of the AH in anti-piracy operations is very much feasible if the AH can operate outside the range of small arms normally used by pirates. As mentioned earlier, the use of AHs against terrorists in, say, J&K, is purely in support of the army/RR/BSF. The question then is: where should we keep these sophisticated expensive flying machines which need dust-free maintenance facilities and high technology simulation support? It is to be clearly understood that mounting AH operations must be undertaken after repeated simulation as is being followed by IAF aircrew on all types of aircraft. Pilots have to fly the mission in simulators, again and again, to eliminate and limit the margin of error. Such simulators are very expensive with advanced technology and only one can be installed in India where aircrew come for training/refresher courses. Now where should this simulator and the AH be and under whose care will it function at its most cost effectiveness for superior training, quality maintenance and proven professionalism?

Where Else But With the IAF

Before there are protests of parochialism, let the author state clearly that while he served proudly with the air force, he has strong and endearing

links with the Indian Army—after all, it is his "parent service" is it not? The author has spent thousands of flying hours in support of the Indian Army as a transport pilot flying the AN-12, IL-76, C-46 aircraft. That said, I must hasten to state firmly and unquestionably that AH assets are best retained with the air force, readily available for all contingencies. Specialised training for aircrew will be centralised, maintenance will be centrally controlled, the logistics and supply chain will be under the same commander, the flight simulator will be under the control of those who have installed, and are maintaining, many such sophisticated flight simulators for different types of aircraft of both Russian/Western origin. The expertise residing with the IAF in all these disciplines far exceeds that residing with the army which must be gracefully accepted. The IAF has been operating AHs for many years, with training/operational concepts refined and upgraded. To now place the AHs under the army would entail a duplication of this effort with no visible advantage since the AH is of doubtful value in the plains, and zero value in the mountains, for close and direct support for corps and divisions troops in both offensive and defensive battles. That the future acquisitions of the AH should be with the IAF needs no further elaboration or justification. And pray, does the IAF have the facilities and wherewithal to take care of, say, 40 AHs? The answer is an emphatic yes.

Air Force Stations are Ready and Prepared

We have enumerated some essential and probable tasks for the AHs and while non-offensive tasks can be anywhere in India, the close support to army/police units battling terrorism and insurgency are essentially in the northeast, J&K, and what is termed as the Naxal corridor. IAF stations already exist in Assam, Arunachal, Nagaland, Manipur, Tripura, Meghalaya, West Bengal, Bihar, Odisha and, of course, J&K. Adequate hangar facilities with huge tarmacs are available; more hangars can be swiftly erected, thus, parking/shelters/maintenance pose no problem at all. Infrastructure by way of logistics/refuelling/administration/accommodation/civic amenities/schools/hospitals/proximity to railhead are in place. Building similar brand new facilities elsewhere would become inescapable if the

AHs were placed under corps/division commanders and the impact of the investment with recurring costs will be prohibitive and unsustainable. Existing air force station tarmacs and open spaces will be most suitable for training and rehearsals by day and night, away from undesirable eyes. Troops from police/army units will get combined training at airfields closest to them with the flying time to operational zones being minimum, resulting in cost effective utilisation of the AHs/anti-insurgency forces. Inspections and evaluation of operational readiness can be done by the respective agencies/HQ /and experts of that very sector with live rehearsals, simulated operations, on-the-job continuation training with para-military and special forces. There will be no duplication of resources and no creation of new locations with each state of the Union seeking its quota as was seen after the terrorist attack on the hotels of Mumbai. Helipads in the operational zones will facilitate swift induction and extrication with speedy relocation to counter terrorist reactions. Storage and safety facilities, along with fully qualified manpower are available at every air force station to inspect/ maintain and activate weapons for AH operations. IAF stations across India are intrinsically configured and customised to maintain, support, and launch special AH operations at short notice. Can there be any doubt or debate about which locations and under which Service India's AH fleet would carry out assured unhindered operations?

CONCLUSION

Senior military commanders have a sacred duty towards procuring weapons which will genuinely enhance the fighting capabilities of the Indian armed forces as well as infusing confidence in the reliability of those weapons and equipment. New weapons cannot have severe inherent limitations while operating in the Indian environment, and be highly susceptible to attrition. The AH is one such weapon: it has little use for India if used in close support for mechanised land forces in the plains, with innumerable anti-helicopter weapons available with our adversaries. In the mountains, the AH is as dead as a dodo, which is abundantly proven. The certitude

with which the success of the AH is still propounded is amazing and needs to be remediated once and for all. The AH has value for money in a relatively benign environment for short, swift, special operations where the opposition has restricted ability to interdict it. Because other nations have huge air arms for each Service does not justify India following suit. Untried and, indeed, failed concepts developed by Western military strategists for European and Middle East scenarios mislead us into a weapon procurement minefield. Thereafter, wasteful expenditure prevents us from getting what we really need to keep India secure and safe. Most certainly, the navy and army must have their special air elements under their command and control, but the Indian armed forces cannot afford the luxury of creating duplicate parallel offensive air forces which are not force multipliers. Like the Hercules, the AHs are ideally suited for very specialised tasks and, naturally, must be operated and maintained by the IAF, which already has the infrastructure and expertise in flying crew, maintenance engineers, logistics and administration, all specifically indoctrinated and trained for airborne operations. These human assets will work for, and with, the AHs throughout their career and not for short durations. The custodian and repository of attack helicopters has to be the Indian Air Force.

THE SIMPLE LIGHT FIGHTER AIRCRAFT REINCARNATED

VIVEK KAPUR

INTRODUCTION

Evolution of fighter aircraft has followed a relatively predictable path with each generation adding greater capability than its predecessor. Technological developments have pushed the envelope of capability to make each new generation of fighter aircraft more sought after by the world's air forces. An attendant problem in this evolution has been the increase in complexity that accompanies greater capability being built into fighter aircraft. Increased complexity has two attendant adverse effects on fighter programmes. These are delays in the design and development programme completion as complex technology incorporation leads to the possibility of unforeseen problems arising, which could take considerable time to resolve satisfactorily. The second issue is that of higher cost as development of new cutting edge technologies and incorporating these into new designs leads to increased cost of Research and Development (R&D) as well of production, driving up the per unit cost of each machine finally delivered. While most modern fighter aircraft manufacturing nations are working on advanced highly capable cutting edge designs, there is a parallel discourse in favour of developing simple and light low cost fighters which may not on an individual basis be as capable as their cutting edge cousins, but still deliver value to their operators.

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The jet engine helped overcome the limitations of power output and propeller linked speed limitations and, hence, rapidly became the power plant of choice for fighter aircraft.

FIGHTER AIRCRAFT DEVELOPMENT MILESTONES

Till the last years of World War II , fighter aircraft were powered by piston engines driving air screws or propellers. The basic technology was similar to that which powered the first heavier than air aircraft on December 17, 1903, though much more advanced, given the almost half century that had elapsed since that first flight at Kitty Hawk.[1] The last few years of World War II saw development of jet engine technology.[2] While Britain's Frank Whittle is credited with developing the first centrifugal compressor-based British jet engine, the Germans developed the world's first axial flow compressor equipped jet engine, the Jumo 004B, which powered the world's first operational jet fighter, the Messerschmitt Me-262.[3] The jet engine helped overcome the limitations of power output and propeller linked speed limitations and, hence, rapidly became the power plant of choice for fighter aircraft. Jet fighter aircraft are classified into "generations" by the West. Generation 1 (Gen1) comprised fighters with all metal bodies and non-afterburning jet engines with primarily gun and/or cannon armament. These were capable of only subsonic speeds in level flight. Air-to-ground armament carried by these aircraft comprised unguided bombs and rockets only. These fighters lacked effective airborne radars and advanced avionics for offensive and defensive use. Gen 1 fighters were the state-of-the-art from the mid-1940s till the mid-1950s. Examples of these include the British Vampire and Gnat, French Ouragan and Mystere, American F-86 Sabre jet and Swedish SAAB J-32 "Lansen", Soviet MiG-15 "Fagot" and MiG-17 "Fresco". Gen 2 fighters built upon the

1. "1903 Wright Flyer ",http://www.wright-brothers.org/Information_Desk/Just_the_Facts/Airplanes/Flyer_I.htm, accessed on September 4, 2014.
2. "The Jet Engine: A Historical Introduction", http://cs.stanford.edu/people/eroberts/courses/ww2/projects/jet-airplanes/planes.html, accessed on September 4, 2014.
3. "Messerschmitt Me 262 Schwalbe / Sturmvogel", ,http://www.fighter-planes.com/info/me262.htm, accessed on September 4, 2014.

earlier technology by fielding jet engines equipped with afterburners. These afterburning engines in combination with more aerodynamically advanced airframes gave them supersonic speed capability, up to around Mach 2.0 in most cases. This generation of fighters also carried airborne radars able to pick up and track airborne targets and Radar Warning Receivers (RWRs). The armament of Gen 2 jet fighters added Air-to-Air (A-A) missiles with Infra-Red (IR) and Semi-Active Radar Homing (SARH) to the earlier machine gun and cannon armament. Gen 2 jet fighters still had basically unguided air-to-ground armament capability. This generation was the state-of-the-art from the mid-1950s till the mid-1960s. Examples include early models of the French Mirage-III, the British English Electric "Lightning", American F-5 "Tiger-II" and F-104 "Starfighter", Swedish J-39 "Draken", and Soviet Su-7, Su-9, Su-11, MiG-19 and MiG-21. Gen 3 jet fighters further improved upon the previous generation in incorporating, firstly, better airborne radars that were able to acquire aerial targets even against the high clutter background of the earth's surface. This enabled "Look Down Shoot Down (LDSD)" capability. These radars also delivered Beyond Visual Range (BVR) aerial target engagement capability and "off boresight" engagement capability through use of better A-A missiles. This latter capability meant that aerial targets that were not directly in front of the Gen 3 fighter could be engaged with fair chances of success. These fighters also introduced better multi-role capability than previous generations. The avionics suites of this generation were also more capable. Examples of this generation include later models of the French Mirage-III, Soviet MiG-23MF, American F-4 "Phantom-II". Gen 3 fighters were the state-of-the-art in the 1960s. Gen 4 fighters were the next step that took performance to a still higher level. These were characterised by more

Gen 3 jet fighters further improved upon the previous generation in incorporating, firstly, better airborne radars that were able to acquire aerial targets even against the high clutter background of the earth's surface. This enabled "Look Down Shoot Down (LDSD)" capability.

advanced aerodynamic designs that gave considerably higher aircraft performance; for the first time making the pilot the weakest link in the execution of tight manoeuvres. Sustained 9 'g' manoeuvres became standard and pilots were hard pressed to retain useful consciousness, in the face of high centripetal and centrifugal acceleration, during execution of tight manoeuvres. In earlier times, aircrew had been required to be cautious to carry out manoeuvres that were within the aircraft's structural limits; in Gen 4 fighters, the human ability to withstand very high accelerations became the limiting factor and not the aircraft structural limitations. Gen 4 fighters also fielded advanced avionics such as Head Up Displays (HUDs), Fly By Wire (FBW) control systems, advanced pulse Doppler radars with Low Density Supersonic Decelerator (LDSD) capability and well developed BVR capability. These fighters also brought in true multi-role capability, including use of guided Air-to-Ground (A-G) weapons, or Precision Guided Munitions (PGMs), for precision attack. The advanced avionics on board gave these aircraft the ability to switch quickly between A-A and A-G roles. Examples of this generation include the American F/A-18A/B "Hornet", F-16A/B "Fighting Falcon", French Mirage-2000, and Soviet Su-27 "Flanker" and MiG-29 "Fulcrum". This generation was the state-of-the-art from the mid-1970s till well into the 1990s. Currently, Gen 5 jet fighters represent the state-of-the-art. This generation has a few unique distinguishing characteristics. Firstly, they are Low Observable (LO) or "stealth" designs which incorporate advanced aerodynamic shaping as well as advanced materials to reduce their radar, IR, acoustic, and visual signatures appreciably. The F-22 "Raptor" is claimed to have a Radar Cross-Section (RCS) of a mere 0.0001 m^2 while a typical Gen 3 or Gen 4 fighter had RCS of between 1 and 5 m^2.[4] Secondly, these aircraft also possess capability to "supercruise" which implies that they can sustain supersonic flight in "dry" or non-reheat power settings, an ability absent in most previous generation fighters. The ability to supercruise indicates a very high energy capability which means that the

4. "Radar Cross-Section (RCS)", http://www.globalsecurity.org/military/world/stealth-aircraft-rcs.htm, accessed on September 4, 2014.

aircraft can sustain high speeds without burning as much fuel as earlier generation aircraft did for similar speed maintenance. This translates into higher radii of action in all profiles. Tactically, it implies that such aircraft have very high energy agility, a crucial factor in modern aerial combat. Lastly, Gen 5 aircraft display a very high degree of multi-sensor fusion which is the ability to take inputs from several different sensors such as radar, IR Search and Track (IRST), data links from other platforms, etc.; and fuse this information into one seamless coherent whole, thus, increasing the pilot's situation awareness manifold. The ability to interface seamlessly with several other platforms and command structures to deliver highly software dependent 'networked' fighting ability is also incorporated in Gen 5 fighters. These characteristics make these fighters extremely lethal. Examples of this generation include the American F-22 "Raptor" and F-35 "Lightning-II" (the F-22 is in squadron service while the F-35 is at the last stages of its troubled development period), the Russian under development Prospective Aviation Komplex [for] Frontal Aviation (PAK FA); the Chinese J-20, and J-31, [the former under development at the Chengdu Aircraft Corporation (CAC) and the latter under development at the Shenyang Aircraft Corporation (SAC)], and Indian collaboration with Russia for the PAK FA derived Fifth Generation Fighter Aircraft (FGFA) which is also under development. The large gap in capability between Gen 5 and Gen 4 fighters led to attempts to retro-apply a few Gen 5 technologies on Gen 4 aircraft. This led to the new Gen 4.5 class of fighters. The changes incorporated include modifications to the airframe through shape changes and application of Radar Absorbent Materials (RAMs) to reduce the RCS, treatment of the engines for reduced IR signature was also applied and advanced avionics from Gen 5 aircraft installed, most prominent among these being the Active Electronically Scanned Array (AESA) radars and sensor fusion technologies. Gen 4.5 fighters remain below Gen 5 in performance but represent an appreciable advance over Gen 4 fighters. Examples of Gen 4.5 fighters are the American F-18E/F "Super Hornet" and F-16 Block 52 upwards and late models of the F-15 "Eagle", Swedish Gripen NG, Soviet Su-35S, European Eurofighter Typhoon and French

"Rafale". Gen 5 fighters started to become the state-of-the-art from the early 2000s and continue till date.[5] In this case, the Gen 4.5 occupy a similar time period in ascendency as Gen 5 fighters.

The technological and capability enhancements incorporated from Gen 1 to Gen 5 fighters as described above have come at two major costs. These are the cost of complexity and the increased financial cost. The time taken between commencing the design of a fighter and its induction into service has increased considerably due to the increased complexity with each new generation. The Gen-1 F-86 Sabre jet took under five years from commencement of design till it entered operational service.[6] The Gen-2 F-104 "Starfighter took a shade over six years from initiation of the programme to entry into service.[7] The Gen-3 F-4 "Phantom-II" took a little over seven years from design initiation till entry into operational service.[8] The Gen-4 F-18 took almost a decade from initiation of design to service entry.[9]The Gen-5 F-22 took twelve years from design initiation till service entry.[10] The F-35 "Lightning-II" programme was initiated in the early 1980s and as this is written, in late 2014, it remains short of readiness for entry into operational squadron service. The operational service entry of the cutting edge Gen-5 F-35 is at least ten years behind schedule. With new problems continually surfacing with this aircraft, it is apparent that the sad saga of development delays in the F-35 programme is not yet over. These delays have led to several partner countries scaling back their F-35 purchase plans.[11] The narrative above brings out very clearly the implications of increased complexity of

5. "Five Generations of Jets", http://www.fighterworld.com.au/az-of-fighter-aircraft/five-generations-of-jets, accessed on September 4, 2014.
6. "North American Aviation….. The Sabres Fly", http://www.boeing.com/boeing/history/narrative/n046naa.page, accessed on September 4, 2014.
7. "Lockheed F-104 "Starfighter"", http://www.oocities.org/uriyan/chap3/chap3.html, accessed on September 4, 2014.
8. "McDonnell Douglas F-4 Phantom II Multi-Role Fighter", http://www.aerospaceweb.org/aircraft/fighter/f4/, accessed on September 4, 2014.
9. McDonnell Douglas (now **Boeing**)/Northrop F/A-18 Hornet Multi-Role Fighter", http://www.aerospaceweb.org/aircraft/fighter/f18/, accessed on September 4, 2014.
10. "F/A-22 Raptor, Lockheed", http://www.fighter-planes.com/info/f22.htm, accessed on September 4, 2014.
11. "Britain 'Should Consider Scrapping F-35 Stealth Fighter'", http://www.telegraph.co.uk/news/uknews/defence/10838453/Britain-should-consider-scrapping-F-35-stealth-fighter.html, accessed on September 4.

each generation as compared to the previous one on the time required to get the aircraft from the drawing board to the squadron tarmac. Very often, these delays, especially if not accurately forecast, could lead to yawning gaps in the operational capability of air forces planning to induct such new machines till such time as the new fighters finally arrive. The flyaway cost of each F-86E in the early 1950s was a little above $200,000.[12] F-4G specialised electronic attack aircraft cost $ 18.4 million each in the late 1960s.[13] In the year 1998, an F-16C/D cost $26.9 million.[14]Each F-22 "Raptor" is assessed to cost $412 million per aircraft at the final production run of just 187 aircraft built.[15] The F-35 is estimated to cost $299.5 million per aircraft.[16] The world's first and only operational stealth bomber, the B-2 "Spirit", cost as much as $ 0.7 to 2.4 billion each in their limited 21 aircraft production run.[17] These facts bring out the huge cost escalation with each new generation of fighter aircraft starting from Gen 1 through Gen 5. These costs combined with the time overruns due to incorporation of cutting edge technology, some of which is typically developed in parallel with the aircraft development, lead to unforeseen delays. The imperative to field the best available weapon systems has driven the race towards development of ever more advanced aircraft. However, the twin shocks of time and cost escalations is forcing a rethink about the viability of fielding large numbers of very advanced high Gen aircraft against the acceptability of larger numbers of less capable machines inducted on time and within reasonable cost.

The higher cost and complexity of the advanced generation such as Gen 5 fighters in comparison to less capable earlier generation fighters is justified in terms of the ability of advanced generation fighters to seize

12. "THE F-86E", http://sabre-pilots.org/classics/v1286e.htm, accessed on September 4.
13. "F-4 Phantom II F-4G Advanced Wild Weasel", http://fas.org/man/dod-101/sys/ac/f-4.htm, accessed on September 4, 2014.
14. "F-16 Fighting Falcon", http://fas.org/man/dod-101/sys/ac/f-16.htm, accessed on September 4, 2014.
15. "F-22 Program Produces Few Planes, Soaring Costs", http://www.latimes.com/business/la-fi-advanced-fighter-woes-20130616-dto-htmlstory.html, accessed on September 4, 2014
16. "How Much the F-35 Really Cost?", http://defense-update.com/20140103_much-f-35-really-costs.html#.VAhK9KO41Kg, accessed on September 4, 2014.
17. "B-2 Stealth Bomber Made its Maiden Flight 25 Years Ago", http://www.latimes.com/business/la-fi-stealthy-b2-bomber-turns-25-20140717-story.html, accessed on October 1, 2014.

Given the likelihood of opponents deploying effective counter-measures to weapons launched by the F-22 and the claimed lower than advertised Single Shot Kill Probability (SSKP) of the weapons launched by the F-22 in the real world, a single F-22 could be expected to be able to defeat three or four opposing fighters with a reasonable degree of success.

the first launch of a weapon advantage over opponents and the ability to engage multiple opponents at the same time or within a very short time period through quick successive launches of weapons at different opponents. The lack of this capability in earlier fighters is touted to give an unassailable advantage in combat to the more capable machines.

A closer examination of the combat advantage above is educative. A typical Gen 5 fighter carries its weapons in internal weapons bays in order to avoid compromising on its Low Observable (LO) characteristics. Thus, while the Gen 5 fighter's LO, supercruise and advanced avionics capabilities give it a definite first shot advantage over less capable adversaries, it cannot carry enough ordnance to take on more than a relatively limited number of opponents due to the constraints of internal stowage space available. The F-22 can carry a maximum of six AIM-120C BVR missiles and two AIM-9 IR guided all aspect Air-to-Air Missiles (A4M) for close combat, in its four internal weapons bays at a time. Such weapons carriage would limit the F-22 to a maximum of six BVR shots and two close combat shots in a mission.[18] Given the likelihood of opponents deploying effective counter-measures to weapons launched by the F-22 and the claimed lower than advertised Single Shot Kill Probability (SSKP) of the weapons launched by the F-22 in the real world, a single F-22 could be expected to be able to defeat three or four opposing fighters with a reasonable degree of success. Now it is interesting to dwell upon the fact that even with the very advanced LO features incorporated on the F-22 and the first operational US stealth, or LO, aircraft (the F-117 and B-2), the RCS and other signatures cannot be reduced

18. "F-22 Raptor Weapon Carriage Capability", http://www.aerospaceweb.org/question/planes/q0105.shtml, accessed on September 15, 2014.

to zero. Thus, adequately powerful enemy sensors will finally detect the advanced Gen 5 aircraft albeit at ranges much closer than those achieved for earlier generation fighters. Once the Gen 5 fighter is detected, it can be shot down. In the real world, a USAF F-117 "Nighthawk" stealth aircraft was actually shot down on March 27, 1999, over Kosovo by an antiquated Soviet era SA-3 "Goa" or SAM-3 "Pechora" Surface-to-Air Guided Weapon (SAGW) manned by the Serbian forces.[19] In situations where it is finally detected by hostile forces' sensors, it is likely that earlier generation fighters opposing the Gen 5 fighter would have detected it at fairly close ranges and would have been exposed to weapons fire from the Gen 5 fighter much earlier. A limited number of opposing fighters could all be destroyed well before they achieve detection range on the LO fighter. However, if the opposition uses mass tactics of accepting the sacrifices of a number of fighters to enable other fighters to close in adequately on the Gen 5 fighter to defeat it, the Gen 5 could be vulnerable. A single F-22 may be able to, given real world constraints and uncertainties, shoot down about four opposing lower generation aircraft with high probability of success, however, it could be defeated if it faces, say, five or more lower generation fighters that act in concert and some of them achieve acquisition on the F-22 by virtue of closing in while other members of their formation (or attack team) are being destroyed by the F-22.

Even the world's largest economy, the US, is unable to provide funds for large production runs of the very expensive Gen 5 fighters. The US was able to build just 21 B-2 "Spirit" stealth bombers at a cost of between $ 900 million and $ 2.4 billion each.

Accountants could be pleased by this financial tally where, say, the loss of four or five fighters costing about $20-25 million each leads to the destruction of a Gen 5 fighter that costs about $300-400 million. The accountant may see merit in the cost benefit balance achieved. Issues of morale and aircrew losses would make the trade-off much more complex. These latter issues,

19. Larkins Dsouza, "This is How the F-117A was Shot Down in Serbia by a SA-3 (S-75) Goa SAM in 1999", http://www.defenceaviation.com/2007/02/how-was-f-117-shot-down-part-1.html, accessed on October 1, 2014.

that transcend cost alone, are the drivers for the development of complex and costly Gen 5 fighters in most advanced nations. Coupled with this is the desire and military imperative to field capabilities seen as near 'undefeatable' and superior to earlier generation machines. Despite all these factors, the extremely high cost of the current generation of cutting edge fighters of Gen 5 is causing concern in all countries. Even the world's largest economy, the US, is unable to provide funds for large production runs of the very expensive Gen 5 fighters. The US was able to build just 21 B-2 "Spirit" stealth bombers at a cost of between $ 900 million and $ 2.4 billion each. It should be borne in mind that modern Gen 4.5 aircraft too are not cheap. A single Eurofighter Typhoon costs about 126 million British Pounds or $204 million[20], while the French Rafale carries a price tag of approximately Euro 142.3 million or $ 179.54 million each. India is reportedly negotiating so as to be paying approximately between Euro 80 to 87 million or $ 100.9 to 109.77 million each for the Rafale fighters as part of its Medium Multi-Role Combat Aircraft (MMRCA) project.[21] The production run of the F-22 "Raptor" has been capped at 187 aircraft primarily due to the aircraft's very high cost. Expected production numbers of the F-35 continue to fluctuate with several partner nations either cancelling or cutting back their initial induction plans, driving the US to find new customers to keep the numbers as high as possible. India has also scaled back its initially declared intention to induct 250 FGFA to a lower number of 144 aircraft for a variety of reasons.

A situation wherein the world's most wealthy nation is unable to field adequate numbers of advanced Gen 5 aircraft has spurred a relook at other options. It has been established through war- gaming that numbers do matter for military forces. A smaller number of very advanced aircraft may be more constrained in delivering the military results required through engaging multiple surface or aerial targets in a conflict situation as compared to a larger number of less capable aircraft. It is likely that a

20. Richard Norton-Taylor, "RAF Typhoon Jets Draw MPs' Flak Over £20bn Price Tag", http://www.theguardian.com/uk/2011/apr/15/raf-typhoon-jets-mps-flak, accessed on October 1, 2014.
21. Suman Sharma, "Rafale Cost Could Soar Into Skies", http://www.sunday-guardian.com/investigation/rafale-cost-could-soar-into-skies, accessed on Ocober 1, 2014.

single aircraft may be able to take on say two targets effectively. Beyond this, it could be severely limited by its inability to carry adequate ordnance and the impossibility of being at more than one geographic location at the same time. Less capable fighters fielded in larger numbers could be present in more locations and take on more tasks, thus, achieving the required military ends even if with relatively higher losses. In case the less capable fighters fielded in larger numbers were to incorporate a few crucial Gen 5 technologies to reduce their RCS, etc and field advanced avionics, the gap in capabilities could be shrunk further, thus, making the cost-benefit ratio tilt even more towards the lower cost, less capable fighter. This thinking has led to the development of several such lower capability simple, light and low cost fighters in the recent past. Cost though often scoffed at by earlier military leaders, is becoming increasingly important in the face of the global economic slowdown since 2008 and consequently shrinking defence budgets in most parts of the world. Compared to the very high costs of Gen 5 and even Gen 4.5 fighter aircraft, typical Gen 4 fighters cost a mere $ 20 to 30 million. Moreover, the Gen 4 fighter aircraft are mature and stable designs in which most quirks and shortfalls have been ironed out; hence, these machines have no unpleasant surprises in store for their operators. A fighter of mature and well established design gives greater reliability but possibly lower capability per unit than a cutting edge fighter. However, on the flip side, given real world monetary constraints, a given sum of money can enable buying of much larger numbers of the earlier Gen fighters than those of the latest Gen. These real world realities have led several manufacturers to either offer established designs in upgraded *avatars,* such as the US Lockheed Martin F-16IN "Viper" and Boeing F-18E/F "Super Hornet", or use existing systems and sub-systems to rapidly develop new aircraft that incorporate earlier proven systems in order to keep costs and lead times low.

A few such new built offerings are the Russian Yak-130 and the American Scorpion. The former aircraft started out as an advanced trainer. The performance achieved by the design coupled with the perceived niche need for a low cost mass produced fighter has led

For countries aspiring towards greater domestic capability in aerospace, this modular approach could yield dividends, especially if their industry has achieved at least some pockets of success.

the Yakolev design bureau to further develop the design into a light fighter *avatar*. In the US, the Scorpion light fighter has been designed on a modular thought process. The Scorpion is a fully company funded project on the lines on which the company concerned, Textron AirLand, also manufactures the Cessna aircraft. A market need is identified and then a product developed to meet that perceived need, using company funds. Sales to the niche market identified earlier help the company recover its investment and make a profit. In order to cut down on both lead time and cost, the Scorpion uses off-the-shelf available components from earlier or existing Gen 4 and Gen 3 fighter programmes put together to deliver a low cost but capable machine. Use of existing component parts means that there is no cost or lead time of new R&D, thus, making the final product cost effective while incorporation of a few advanced features such as modern composite materials, sub-systems such as weapon system computers, and advanced avionics such as the AESA radars give a better combat effectiveness score than the Gen 3 and Gen 4 fighters from which it borrows its component parts. The Scorpion has reportedly moved from the design board to flight in a mere 23 months at a cost per piece of just $ 20 million.[22] This new pragmatic approach is an innovative solution to retaining needed combat effectiveness for modern military aviation while ensuring that the overall costs are within reasonable limits. Such an approach deserves attention from countries like India, that are starting out to build a modern and capable domestic aircraft industry. The light low cost fighter may be more achievable in a reasonable timeframe than a more advanced machine. Once this capability is in place, a system of ongoing innovation and

22. Russell Hotten, "Farnborough Airshow: The Scorpion in Search of a Customer", http://www.bbc.com/news/business-28260781, accessed on October 3, 2014.

progressive improvements could close the gap with more advanced aircraft in a cost-effective manner, without compromising on national security.

The incorporation of ever more advanced technology has invariably made the development time cycle of each new generation of fighters lengthier while, at the same time, adding to the development and per unit cost.

IMPLICATIONS FOR AEROSPACE ASPIRANTS

For countries aspiring towards greater domestic capability in aerospace, this modular approach could yield dividends, especially if their industry has achieved at least some pockets of success. For instance, the Indian aircraft industry could build upon its earlier pockets of success with the HJT-16, HF-24, to marry the successful and usable technologies, components or/and techniques from these earlier programmes with newer learning and successes in the Light Combat Aircraft (LCA) "Tejas", Advanced Light Helicopter (ALH) "Dhruv", Airborne Early Warning and Control (AEW & C), and Jaguar/MiG-27ML upgrade programmes amongst others to develop similar products as the Scorpion as the low or even medium end of the country's future fighter aircraft force, at affordable costs. Such new modular products, if built at reasonable cost and in reasonable timeframes through using existing sub-parts from earlier programmes, could help India close the gap with more advanced aircraft manufacturing nations without any compromise in national security. These new products could see high volume production while costlier more capable machines, say, such as the upgraded Su-30MKIs, Rafales and Fifth Generation Fighter Aircraft (FGFA) could fill the high technology needs, though in fewer numbers.

CONCLUSION

Fighter aircraft development has been driven by technology to a great extent. Starting with very simple machines in the early years of the last century, the fighter has developed into a very complex system of systems. These advances have been spurred on by technological

advances in diverse fields ranging from high strength but lightweight materials, power plants to digital computing. The incorporation of ever more advanced technology has invariably made the development time cycle of each new generation of fighters lengthier while, at the same time, adding to the development and per unit cost. These increases in cost have constrained even the world's richest nation from going in for large numbers of the latest generation fighters. In parallel, a debate on the virtues of lower capability and cost fighters which could be fielded in large numbers has developed further into many manufacturers in the world seeing a market for relatively simple light fighter aircraft. This has led to modification of some earlier generation fighters to make them more effective at reasonable cost while also spurring other manufacturers to develop "modular" designs that build upon available proven component parts and systems to rapidly build cheap but effective fighters. The renewed interest in this new type of fighter aircraft holds out promise for nations with a few successes in building aircraft and that are trying to establish themselves as aircraft manufacturing countries.

INDIA AND THE "INDO-PACIFIC"

PRERNA GANDHI

INTRODUCTION

The concept of "Indo-Pacific" as a spatial region in marine biology has been in use for quite some time. It is essentially used to denote the continuity of marine habitats and species from Africa's east coast to the outer limits of Oceania's geographical region (that do not exist in the Atlantic Ocean). The irony is even when used now as a strategic concept, it primarily refers to the maritime arena of security**.** The Indo-Pacific as a spatial geo-strategic region gained heavy traction since the publication of the 2013 Australian Defence White Paper when Australia became the first country to categorically define its zone of strategic interest as the **Indo-Pacific**. The 2013 White Paper recognised that a new "Indo-Pacific strategic arc" is beginning to emerge with the increasing economic and security interdependencies between the Indian and Pacific Oceans demarcating Southeast Asia as its "geographic centre". However, the concept of Indo-Pacific has been around since the new millennium. The term"Indo-Pacific" has been debated over, and used by, the US, Japan, Australia, Indonesia, China and India in varying degrees to comprehend the radical changes in international affairs and define their respective roles and national interests. Be it the US' Asia Pivot, Burma's Indo-Pacific Economic Corridor, Japan's Confluence of Two Seas, Australia's Two Ocean Navy and Indo-Pacific Strategic Zone of Interest, Indonesia's

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With the economic resurgence of Asia, the *Indian-Pacific Ocean combine* has replaced the Atlantic–Pacific Ocean combine as the new hub of strategic and economic activity. Countries in the region are bound to each other by economic linkages through trade and production networks, which have led the region to have a joint stake in its shared prosperity.

Indo-Pacific Treaty of Friendship and Cooperation, China's Yin Tai Concept, or even India's Look East Policy, the term *"Indo-Pacific"* has entered the international strategic lexicon and is here to stay.

With the economic resurgence of Asia, the *Indian-Pacific Ocean combine* has replaced the Atlantic–Pacific Ocean combine as the new hub of strategic and economic activity. Countries in the region are bound to each other by economic linkages through trade and production networks, which have led the region to have a joint stake in its shared prosperity. Much of that economic activity in the region is intra-firm trade that is carried via the seas. This has led the Indian Ocean Sea Lines of Communication (SLOCs) to gain tremendous strategic prominence after being considered as international backwaters for a greater part of the 20th century, since over 90 percent of international trade is carried by sea, and of that, over half crosses the Indian Ocean. In monetary terms, over US$ 7 trillion in international trade crosses the Indian Ocean every year on more than 23,000 ships, accounting for 50 percent of all container traffic and a full 70 percent of global oil and gas exports.[1] These emerging dependencies between the Indian and Pacific Oceans have been a primary cause to combine the two economic and geo-politically distinct regions into a single supra-strategic region still defined by the sub-regional security and commercial structures. Since this region is a hotbed of not only traditional security concerns such as maritime disputes over territory, sovereignty and resources but also of non-traditional security threats such as piracy, terrorism and trafficking, there has been a need for maritime

1. Hugh D. Wetherald, "Indian Ocean Maritime Security: Challenges and Opportunities", in Pradeep Kaushiva and Abhijit Singh, eds., *Indian Ocean Challenges* (New Delhi: Knowledge World, 2013), p. 4.

security of the global commons of ocean waters to be a multilateral effort and joint essential priority for all countries in the region.

Seventy percent of the world's surface is covered by the oceans, 80 percent of the world's population is moving closer to the ocean littorals and the majority of the world's major cities, industries and urban populations lie within 200 km of the coast, and 90 percent of international trade by weight and volume, including most of the strategic cargo, is carried over the oceans.

INDO-PACIFIC AND "GLOBAL COMMONS"

The United Nations Convention on the Law of the Sea (UNCLOS) also called the Law of the Sea Treaty is an international agreement that defines the rights and responsibilities of nations with respect to their use of the world's oceans, establishing guidelines for businesses, the environment, and the management of marine natural resources. Concluded in 1982 and in effect from 1994, UNCLOS recognised the oceans as the common heritage of mankind and freedom of navigation on the high seas as a fundamental principle of maritime law. While it allowed for coastal waters to be claimed for private use such as for oil drilling, oceans more than two hundred miles from land were stated to belong to all mankind.[2] Therefore, unlike every inch of land which is legally owned by nations, the seas, in their natural state, are not under any political domain. The geo-strategic significance of the maritime domain becomes all the more important when one looks at the fact that over 150 of the 192 member states of the United Nations are coastal states. However, with globalisation, the world today is increasingly becoming economically and geo-politically integrated, with the maritime dimension gaining quantum importance of what is often referred to as the '70, 80, 90 Concept'. Seventy percent of the world's surface is covered by the oceans, 80 percent of the world's population is moving closer to the ocean littorals and the majority

2. "United Nations Convention on the Law of the Sea", http://en.wikipedia.org/wiki/United_Nations_Convention_on_the_Law_of_the_Sea

of the world's major cities, industries and urban populations lie within 200 km of the coast, and 90 percent of international trade by weight and volume, including most of the strategic cargo, is carried over the oceans.[3] As the bulk of international activity is carried via the Indian Ocean, there has been a steady build-up of naval presence in the Indian Ocean. Also with the relative decline of US power and control over the **global commons**—and the rapid diffusion of technological capabilities and crowding of the global commons—the management of the commons in a multipolar world has resulted in further issues and problems.

RATIONALE Vs CRITIQUE FOR "INDO-PACIFIC"

The rationale for the Indo-Pacific derives from the rapid growth in energy, economic and security linkages between the Indian Ocean region and Western Pacific that have created a single strategic system. Approximately 77 per cent of the world's population resides in the "Indo-Pacific" region.[4] Trading nations globally have stakes in its shipping lanes. Much of the United States and European Union (EU) nations' trade with Asia which traverses across the Pacific remains dependent on Indian Ocean SLOCs. This is due to the dependence of the East Asian trading countries on raw material and other sources being transported across the Indian Ocean from East Africa, the Gulf, South Asia, or Australia. Therefore, though it ranks only fifth out of nine regions [as classified by Lloyd's Marine Intelligence Unit (MIU) in London] in terms of commercial shipping port call volume (the first three being Northern Europe, the Far East and the Mediterranean/ Black Sea), the Indian Ocean is an inescapably central feature of global maritime trade.[5] However, 15 of the top 20 container terminals in terms of throughput capacity are located in the Indo-Pacific, with China leading the

3. Sureesh Mehta, "The Centrality of the Indian Ocean to Global Maritime Security", in Kaushiva and Singh, eds., n.1, p. 4.
4. Rajiv K Bhatia, "Foreward", in Rajiv K. Bhatia and Vijay Sakhuja, eds., *Indo- Pacific Region: Political and Strategic Prospects* (New Delhi: Vij Books India Pvt Ltd, 2014), p. vii.
5. Amit A Pandya and Rupert Herbert Burns, "Maritime Commerce and Security: The Indian Ocean", *Stimson*, February 2011, http://www.stimson.org/images/uploads/research-pdfs/March4_-_Full.pdf.

field with 9 such terminals.[6] The concept of Indo-Pacific not only emphasises the sea as the main medium for commercial and security integration by virtue of the large volumes of trade, it is also breaking down the late 20th century idea of East Asia and South Asia as separate strategic settings.

Some researchers argue that the Indo-Pacific is too broad a term to denote a meaningful strategic system as it does not have clear organising principles to analyse and explain the interactions of big and rising powers. Critics also reiterate that no single strategic system is capable of capturing all the complex contingencies of the "two oceans-one continent" region as the Indo-Pacific construct cannot be developed sufficiently to simultaneously address traditional security issues in the sub-regions along with other non-traditional challenges. However, the Indo-Pacific's major criticism stems from it being a code for containing China and serving dual US purposes of constraining the rise of a "peer competitor" in Asia and preventing the regional integration from being "inward looking and exclusive." The political/economic terminology of regions, though relying on neutral vocabulary of geography, still has an element of tilting to particular countries that become the main players and mainstay of the political/economic realm in those specific regions. Wherein East Asia as a term tilted to China and Asia-Pacific to the US, **Indo-Pacific** is ambiguous in whether it calls for a defining role for India or the growing significance of the Indian Ocean to the Asia-Pacific.

The Indo-Pacific region, like the Indian Ocean Region (IOR), is geographically constrained and access is feasible only through narrow choke points. This leads to any traditional or non-traditional threat having a transnational nature, wherein events in one part of the region impact another, thereby creating a need for an integrated strategic system. A major disruption anywhere in the region will have large repercussions for the interests of all the major powers, and the future of the Indo-Pacific will be strengthened or shaken by how they get along. In the future, China will have a stake in the fate of Afghanistan, and issues pertaining to the

6. Raghavendra Mishra, "India in the Indo-Pacific Region: Maritime Stakes and Challenges", in Bhatia and Sakhuja, eds., n.4, p. 159.

Yearly trade that passes through the New Silk Route from the Strait of Hormuz to the Strait of Malacca has been estimated at a whopping US$18 trillion, and roughly 17 million barrels, comprising a fifth of the world's oil supplies, pass through the Strait of Hormuz.

South China Sea will not be a matter for just East Asia, let alone for China. Further, with rapid globalisation, there has been a rapid expansion of maritime commerce, capacity and technology which, in turn, has facilitated newer developments. Increasingly sophisticated means for transporting large cargoes – such as containerisation, or increasingly large vessels for specialised transport of liquid and dry cargoes in bulk – have transformed the speed and efficiency of transport logistics.[7] This has made possible the development of globally distributed supply chains and production processes, especially the dense and elaborate network of cross-border production networks in East Asia, that have tied the stakes of the region in a shared destiny.

STAKES IN "INDO-PACIFIC"

The Indo-Pacific is rich in natural resources, especially hydrocarbons which fuel the economic engines of the world's economies. Around 65 per cent of the world's oil reserves belong to just 10 of the Indian Ocean littoral states. Further, 90 per cent of the world's seaborne trade, primarily oil, passes through the Indian Ocean. Studies show that the cost of exporting oil over a distance of 1,000 km (540 nautical miles—nm) in 2007 was estimated at $0.163 by tanker, $0.793 via pipeline and $7.190 by train. Indian Ocean SLOCs assume critical importance not only to global trade and economic stability but also to the security of the global oil trade.[8] Further, the Indian Ocean holds two of the primary gateways in world maritime trade: the Strait of Hormuz and the Strait of Malacca. Yearly trade that passes through the New Silk Route from the Strait of Hormuz to the Strait of Malacca has been estimated at a whopping US$18 trillion, and roughly 17 million barrels,

7. Pandya and Burns, n.5.
8. Mishra, n.6 p. 153.

comprising a fifth of the world's oil supplies, pass through the Strait of Hormuz.[9] Further, with more than 80,000 vessels transiting through the straits every year, the Malacca Strait is the world's most crucial strategic choke point and with new projects going on in India, Sri Lanka, Bangladesh, Myanmar, Vietnam and Thailand, the use of the straits will only grow. Owing to the primacy of the maritime domain, even continental connections across Asia, like the evolving "Indo-Pacific" Corridor comprising Burma and Bangladesh, will gain prominence where they are linked to seaports.

The Indian Ocean harbours a wealth of mineral and living resources such as fisheries. Various technological, environmental, economic, and political factors determine the potential for developing these assets.

The demands of Asia's growing middle classes also accelerate the exploitation of the ocean's mineral and food resources. In the Indian Ocean, the International Seabed Authority – the UN agency responsible for mineral rights in the high seas – in 1987 accorded India exclusive rights to explore mining polymetallic nodules in the Central Indian Ocean Basin. India's allocated area of 150,000 sq km may contain 380 million metric tonnes of nodules. In July 2011, China received the right to explore a 10,000 sq km polymetallic sulphide ore deposit in the southwest Indian Ocean. While these enterprises remain exploratory, India's National Institute of Ocean Technology has undertaken sea trials and plans to deploy a fully developed deep-sea mining system in the next few years. Beyond the Indian Ocean, the Canada-based Nautilus Minerals and the UK affiliate of the US' Lockheed Martin have announced plans to begin commercial mining operations in the Pacific. Yet practical development of seabed minerals faces major hurdles. Only 2 to 3 percent of the global sea floor has been properly mapped, and just 0.0001 percent has been scientifically investigated. Identifying resource sites whose value exceeds more readily accessible onshore deposits will prove a difficult task, requiring ventures with uncertain rewards. Their highly localised concentration renders commercially viable recovery of

9. "Rising Stakes in Indian Ocean", http://m.newindianexpress.com/opinion/251181 .

polymetallic sulphides especially problematic. Seafloor deposits, usually of one to five megatons, also tend to be much smaller than those onshore, which can reach 50 to 60 megatons. Furthermore, deep-sea deposits, which typically exhibit a 0.2 percent concentration of rare earth minerals, pale in comparison to onshore ore deposits, which can have 5 to 10 percent concentrations.[10]

The Indian Ocean harbours a wealth of mineral and living resources such as fisheries. Various technological, environmental, economic, and political factors determine the potential for developing these assets. The security situation in the Indo-Pacific is complicated by maritime boundary disputes. As energy security becomes important for nations, maritime boundary delineation has turned into a potent source of international conflict. While potentially rich oil and gas resources lie within national maritime zones, they will be inaccessible for exploitation as long as the hundreds of overlapping offshore boundary claims remain in dispute. While long standing maritime boundary disputes in the South China Sea attract much media attention, disagreements over territorial waters and in the Bay of Bengal are also on the rise. India, Bangladesh and Vietnam today find themselves in the middle of such a dispute. There is a need for clear principles and mutually agreed upon framework on the basis of which such maritime boundary disagreements can be resolved.[11]

THE GAME OF POLITICAL PRIORITIES Vs ECONOMIC NECESSITIES

As China turns into one of the strongest competitors the US has faced to its unilateral dominance in the longest time, the dynamics of power rivalry, security concerns coupled with extensive economic interdependence have led to limited space for manoeuvring for both the US and China(unlike the US-Soviet rivalry which had no significant economic element). Like Australia, a majority of the middle powers in the East Asian region have security ties to the US or host its military bases, yet the same countries

10. David Michel and Russell Sticklor, "Indian Ocean Rising: Maritime Security and Policy Challenges", *Stimson*, July 2012, http://www.stimson.org/images/uploads/research-pdfs/Book_IOR_2.pdf.
11. Sureesh Mehta, "The Emergence of a Geostrategic Realm", in Kaushiva and Singh, eds., n.1, p. 18.

have China as their largest trading partner. This had reduced the space for diplomatic and political strategising, distorting the balance of power in the region. The East Asian region, while contributing 26 percent to world Gross Domestic Product (GDP) (the same as North America), is home to four of the most volatile political conflicts: the Taiwan Strait, Korean Peninsula, East China Sea and South China Sea. Further, according to a 2008 analysis of global conflicts by the Heidelberg Institute for International Conflict Research, altogether 42 per cent of world conflicts can be associated with Indian Ocean countries. In 2011, in all, 142 political conflicts were recorded in the IOR, representing more than a third of the 388 conflicts worldwide, including 12 of the world's 20 wars, as well as an additional eight limited wars.[12] Hence, in this scenario of balancing out their political priorities and economic necessities, the countries in the Indo-Pacific region look to bring in multilateral power players to balance out the delicate power scenario that is building up after the decline of US unilateralism.

STRATEGIC MANAGEMENT OF "INDO-PACIFIC"

Economics and economic integration have only recently emerged as organising principles on par with traditional factors in establishing strategic structures and international institutions to manage the *"global commons"*. The rapid rise of Asian economic giants such as China and India has led the **Asian Century** to be dubbed as the century of economics. World trade has leapfrogged world GDP in the recent decade. Further, with increasing economic openness, growing economic interdependence and deepening production networks in the East Asian region, economic growth has truly assumed a more transnational nature. While bilateral Free Trade Agreements (FTAs) and other FTAs between the Association of Southeast Asian Nations (ASEAN) and other regional countries such as India, China, Korea and Japan exist, only the Asia-Pacific Trade Agreement (APTA) has encompassed membership from both South Asia and East Asia. An effort, however, was made by Japan when it proposed the Comprehensive Economic Partnership for East Asia (CEPEA) in 2007 to include 16 member

12. Michel and Sticklor, n.10.

nations of ASEAN (ASEAN Plus Three along with India, Australia and New Zealand) to strengthen economic ties between South and East Asia and reduce development inequalities in Asia. However, despite its all-inclusive aims, it was disrupted by China that favoured a more East Asia centric association around ASEAN Plus Three and proposed its own East Asia Free Trade Area (EAFTA), favoured by China in 2001.[13]

The tussle between CEPEA and EAFTA ended in 2011 when ASEAN proposed to formulate the ASEAN centred FTA—Regional Comprehensive Economic Partnership (RCEP). Negotiations for the RCEP were launched in November 2012 during the 7th East Asian Summit and are expected to be concluded by 2015. The RCEP, if successful would achieve the feat of being the biggest trading pact in the world incorporating 45 percent of the world's population and 1/3rd of the global economy. However, the RCEP, despite its sincerity to untangle the "noodle bowl" resulted by the proliferation of FTAs in the Asian region, is controversially seen as a Chinese attempt to exclude the US. Even the US led regional trade agreements such as the Trans-Pacific Partnership (TPP) and the Asia-Pacific Economic Cooperation's (APEC's) Free Trade Area of the Asia-Pacific (which includes non-ASEAN members) are perceived as US attempts to coopt its geo-political allies into its larger geo-economic system. Therefore, despite the win-win scenario of economics, competing political motivations and disagreements to forming a regional arrangement may lead to a bleak future for the Indo-Pacific.[14]

On the security front, a range of multilateral regional organisations in the IOR such as IOR-ARC (Indian Ocean Rim Association for Regional Cooperation), IONS (Indian Ocean NAVAL Symposium), CMF (Combined Maritime Forces) comprising three distinct Combined Task Forces or CTFs), SAARC (South Asian Association for Regional Cooperation) and BIMSTEC (Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation) have been working with other groupings in the West Pacific region such as ASEAN, ASEAN Regional Forum (ARF), ASEAN Defence

13. Asanga Abeyagoonasekera and Amali Wedagedara, "Prospects for Economic Integration in Indo-Pacific Region: A Perspective from Sri Lanka", in Bhatia and Sakhuja, eds.,n.4, pp.167- 168.
14. Ibid.

Ministers Meeting (ADMM)+ and the East Asia Summit, to ensure better governance in the broader Indo-Pacific region. ASEAN led initiatives such as the ASEAN Maritime Forum (AMF) and Expanded ASEAN Maritime Forum (EAMF), an offshoot of the AMF, encourages EAS participating countries to utilise opportunities and address maritime challenges building upon the ASEAN-based platform. In recent days, there have been efforts by countries in South and Southeast Asia to revive the IOR-ARC, giving it an expansive and ambitious mandate that includes security.[15] As Australia took the chair of IOR-ARC in late 2013, it has led the association to greater facilitation of regional cooperation and become a strong vocal proponent of the Indo-Pacific.[16]

Other regional organisations include the Information Fusion Centre (IFC) hosted by the Republic of Singapore Navy, which is a regional Maritime Security (MARSEC) information-sharing centre. Inaugurated on April 27, 2009, it aims to facilitate information-sharing and collaboration between partners to enhance maritime security and ensure timely and effective responses by partner countries to MARSEC incidents. With linkages to 64 agencies in 34 countries, and with 15 International Liaison Officers (ILOs) from 13 countries currently working in it, the IFC also conducts various capacity-building activities such as international information-sharing exercises and MARSEC workshops such as the biennial Maritime Information Sharing Exercise (MARISX) and the annual Regional Maritime Security Practitioner Course. The ASEAN ILOs in IFC also serve as the Permanent Secretariat of the ASEAN Navy Chiefs' Meeting. As the Permanent Secretariat, the IFC facilitates and monitors the development of new MARSEC initiatives among ASEAN Navies. The IFC also hosts maritime information sharing portals such as the ASEAN Information Sharing Portal (AIP) and the Regional Maritime Information Exchange (ReMIX), which facilitates information sharing

15. Mehta, n.11, p. 19.
16. "India to Handover IOR-ARC Chair to Australia", http://www.newindianexpress.com/business/news/India-to-handover-IOR-ARC-Chair-to-Australia/2013/10/31/article1866479.ece , October 31, 2013.

On July 20, 2004, Indonesia, Malaysia, and Singapore launched the first trilateral patrol called Operation MALSINDO, a year-round coordinated naval patrol. In September 2005, the three countries also launched the coordinated aerial surveillance Eyes in the Sky (EIS) initiative.

among ASEAN Navies and Western Pacific Naval Symposium members, respectively.[17]

Another initiative is the Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia (ReCAAP), a first regional government-to-government agreement to promote and enhance cooperation against piracy and armed robbery in Asia. It was finalised on November 11, 2004, and entered into force on September 4, 2006. To date, 19 states have become contracting parties to ReCAAP. It also includes the ReCAAP Information Sharing Centre (ISC), an initiative for facilitating the dissemination of piracy-related information. ReCAAP has many initiatives, including identification of focal points in participating countries and its capacity-building programmes. Despite the limitation that Indonesia and Malaysia are not parties to ReCAAP at present, it provides a useful "building block" for a more integrated approach to good order at sea. Data from the International Maritime Bureau (IMB) and the ReCAAP ISC show that the situation with piracy and armed robbery against ships worldwide had improved in 2012 compared to 2011.[18]

The East Asian littoral states, on their part, to address the piracy problem in the Strait of Malacca have also made numerous initiatives. On July 20, 2004, Indonesia, Malaysia, and Singapore launched the first trilateral patrol called Operation MALSINDO, a year-round coordinated naval patrol. In September 2005, the three countries also launched the coordinated aerial surveillance Eyes in the Sky (EIS) initiative, wherein

17. "Fact Sheet: Information Fusion Centre (IFC)", http://www.mindef.gov.sg/imindef/press_room/official_releases/nr/2014/apr/04apr14_nr/04apr14_fs.print.noimg.html .
18. "Report by the ReCAAP Information Sharing Centre for the Ninth Meeting of the United Nations Open-ended Consultative Process on Oceans and the Law of the Sea", http://www.un.org/depts/los/consultative_process/mar_sec_submissions/recaap.pdf.

each country would patrol twice per week along the Malacca and Singapore Straits and in which each flight would carry a maritime patrol team made up of military personnel from each of the participating states. To further improve the effectiveness of the naval and air patrols, terms of reference and standard operating procedures were agreed on in April 2006 and the combined efforts were renamed the Malacca Strait Patrols (MSP). The MSP has three elements: the Malacca Strait Surface Patrols (MSSP); the EIS; and the Intelligence Exchange Group (IEG). The IEG developed the Malacca Strait Patrols Information System (MSP-IS) to improve coordination and situational awareness at sea among the three countries. In 2008, the MSP was given a boost when Thailand joined both the MSSP and the EIS. Thailand's area of operation comprises the northern approaches to the Malacca Strait in the Andaman Sea.[19]

More than three and a half decades of rapid economic growth following its opening up in the late 1970s were bound to produce a shift in the relative power of China just by virtue of its sheer numbers. However, China's rise has turned out to be all the more theatrical because of the weaker trajectories of its competitors.

Along with resolutions and recommendations adopted by the United Nations and the International Maritime Organisation (IMO), the regional states expressed their commitment and efforts to together combat piracy through the Tokyo Appeal (March 2000), the Model Action Plan (April 2000), the Asia Anti-Piracy Challenges 2000 (April 2000), and the Asia Maritime Security Initiative 2004 (June 2004). However, it is not likely that these efforts will serve as an effective framework for regional efforts since they are not binding. Several UN Security Council (UNSC) resolutions based on the UNCLOS have been passed to deal with the scourge of piracy but they have collectively been ineffective in dealing with the issue. The biggest drawback of the 1982 UNCLOS has been that it addresses only

19. Suk Kyoon Kim, "Maritime Security Initiatives in East Asia: Assessment and the Way Forward", *Ocean Development & International Law*, vol. 42, issue 3, July-September, 2011, p. 229.

piracy and largely precludes the applicability of piracy laws to maritime terrorism. In order to address this legal vacuum, the Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation (SUA Convention) and the Protocol for the Suppression of Unlawful Acts Against the Safety of Fixed Platforms located on the continental shelf were adopted in 1988 and entered into force in 1992 to expedite the extradition and prosecution of the offenders.[20]

Cooperation and collaboration to deal with the common challenges offer a good vehicle for the engagement of ASEAN and nations within the IOR, and will engender trust and confidence in the member countries of the Indo-Pacific.

ACCOMMODATING THE DRAGON

Far-reaching political events and accelerating global economic linkages since the 2000s have led to blurring of lines between the traditional and non-traditional, regional and global, inter-state and transnational issues. The greatest of all these changes and challenges has been the remarkable and rapid geo-political, geo-economic and geo-strategic rise of China. More than three and a half decades of rapid economic growth following its opening up in the late 1970s were bound to produce a shift in the relative power of China just by virtue of its sheer numbers. However, China's rise has turned out to be all the more theatrical because of the weaker trajectories of its competitors. The Soviet Union collapsed and the successive Russian governments have struggled to define an international role whilst reminiscing about its erstwhile glory days. Japan stagnated economically and has vacillated between dependence, interdependence and independence from the US in ensuring its defence and security. India, till two decades earlier, maintained autarky and engaged less deeply than China with the world economy and focussed most of its security energy on its nearby enemy Pakistan. The US with its unique situation of being the only superpower, entangled itself in a series of wars and confrontations that weakened rather than strengthened

20. Ibid., p. 232.

its global influence. For all these reasons, the shift in China's relative power has been more dramatic than it otherwise would have been.[21]

With its massive economic growth, China now assertively seeks to shape regional and international conditions to serve Chinese interests. In the modern world system, world powers have been sea (ocean) powers as sea power confers greater mobility, security of trade along with access to a wider variety of resources and effecting desired national interests. China has been very visible in expanding its maritime capabilities to ensure unhindered logistics for its resources and trade along with securing its maritime frontier.[22] It be won't be an exaggeration to say that accommodating the expansion of China's interests, its aggressive diplomacy and growing strategic reach into the Indian Ocean is what most of all defines the Indo-Pacific. China is more strongly connected to Southeast Asia and South Asia than other states in these regions, including India. China is now the number one trading partner of more than 120 countries and regions in comparison to the US which is the largest trading partner of about 75 countries. China's annual imports in merchandise of about US$2 trillion create numerous jobs and investment opportunities, propelling economic growth for its trading partners, thereby giving it tremendous bargaining power and leverage in international affairs.[23]

The US' shifting military and diplomatic 'pivot' or the 'US' rebalancing strategy' is also primarily a strategic response to China's military assertiveness and deliberate belligerence in the East and South China Seas. China's strategy, on the other hand, is based on a strategy of denial of American intervention power through development of Anti-Access and Area Denial (A2AD) capabilities to seek greater strategic influence to match its economic weight. As a matter of fact, it is fear of China's rising clout in Asian regionalism that largely accounts for the US', Japan's and Australia's overtures to India and their endorsement of the 'Indo-

21.. Andrew J Nathan and Andrew Scobell, *China's Search For Security* (New York: Columbia University Press, 2012), introduction p xiii.
22. Mishra, n.6, pp.140-141.
23. "China Replaces US as No. 1 Merchandise Trader", http://www.chinapost.com.tw/china/china-business/2014/03/03/401877/p1/China-replaces.htm , March 3, 2014.

Pacific'. While 'Indo-Pacific' as a strategic concept brings India into the power politics of China's neighbourhood in an effort to dilute Chinese influence in East Asia, the Indo-Pacific also recognises China's role and interests in the Indian Ocean posing a challenge to Indian dominance. Hence, it is ironical that a majority of countries pushing for an Indo-Pacific categorisation are the ones that have extensive economic relations with China, running into billions of dollars. Australia and Japan have China as their largest trading partner, while the US and Indonesia have China as their second largest trading partner. However, the US-China bilateral trade is also the second largest bilateral trade relationship in the world (after the US-Canada one) standing at more than US $550 billion.

ROLE OF SOUTHEAST ASIA (ASEAN)

It isn't any surprise that the notion of Indo-Pacific elaborated by most nations has had one commonality, that of ASEAN centrality. China has shown difficulty in accepting the "Asia-Pacific" label which draws the US into Asia, and even more so the "Indo-Pacific", which creates a triumvirate of regional powers by including India, and has continued to insist on exclusionary strategies based on narrow definitions of its own security interests. However, even China has been accepting of the new regional architecture building, based on multipolarity and multilateralism espoused by ASEAN rather than a single power taking centre-stage. Southeast Asia is located strategically at the crossroads of the Indian and Pacific Oceans. While ASEAN's solidarity faces numerous challenges due to the unresolved bilateral disputes among its members and its inability to pursue a united stand in the South China Sea, ASEAN has emerged as a workable regional grouping. Indonesia, the hinge of the door that swings between the Pacific and Indian Oceans and a staunch champion of ASEAN centrality to managing the Asian strategic environment has proactively called for an Indo-Pacific "Treaty of Friendship and Cooperation." The proposal echoes the 1976 Treaty of Amity and Cooperation in Southeast Asia and revolves around ASEAN norms : confidence-building and peaceful resolution of disputes and security. India too has been constantly

emphatic on establishing "an open, balanced, inclusive and transparent regional architecture" defining ASEAN as the "lynchpin" of the economic and security structures in the region.

After the end of World War II and the ensuing Cold War, Asia was divided into the two power camps of the US and USSR. From the late 1960s, the concept of Asia-Pacific was propounded by the US and encouraged by its allies, Japan and Australia, to reflect the US crucial strategic and economic role across the water. The establishment of the Asia-Pacific Economic Cooperation (APEC) in the late 1980s made it evident that the idea of the **Asia-Pacific** as the grand design of Asia's strategic and commercial template was there to stay. After the end of the Cold War, it helped allay concerns about US retrenchment from the region. With China's rise and its subsequent engaging with Asian multilateralism in the 1990s, the game was distinctly Asia-Pacific. However, it was not only APEC but ASEAN and its wider security dialogues such as ARF, ADMM and ASEAN Maritime Forum that attracted even non-members to become part of the process that soon became predominant in the strategic template of Asia. However, the limits of being an East Asian exclusive strategic system were clearly evident and the ARF soon came to include India and other South Asian players. And at its defining moment—the establishment of the East Asia Summit (EAS) in 2005—the process of Asian institution-building took a decisive turn. ASEAN's acceptance of India, Australia and New Zealand as members of that regional leaders' forum meeting from the outset, despite China's vehement protests, led to the beginning of an Indo-Pacific era, though few noticed it at the time.[24]

Therefore, ASEAN's centrality to the success or failure of the Indo-Pacific as a strategic system has roots right from its inception and is even now crucial to maintaining the balance of power when the emergence of multilateral powers along with new rivalries and alliance equations threatens to disrupt the precarious internal system.

24. Rory Medcalf, "In Defence of the Indo-Pacific: Australia's New Strategic Map", *Australian Journal of International Affairs*, vol. 68, no. 4, 2014, pp. 470-483.

The large coincidence between the geographical stretch of the Indo-Pacific and the 'areas of interest' defined by the Indian Navy in its doctrine underlie the Indian interests in the Indo-Pacific.

CONCLUSION

The Indo-Pacific as a strategic space incorporates the growing role of India which has tended to be seen as an outlier in the strategic concepts pertaining to the Asia-Pacific.[25] Given the traditions of non-alignment in its foreign policy, India is neither feared nor associated with a quest for hegemony. While the earlier concept of the Asia-Pacific had sought to exclude India, in contrast, the term Indo-Pacific encompasses the subcontinent as an integral part of the Asian system. India has featured prominently in international commentaries as a key partner in the Indo-Pacific regional architecture-building. According to Stephen Smith, for instance, in addition to the need to ensure maritime security in the Indian Ocean, which has emerged as a crucial thoroughfare for global trade, it is India's 'rise' that is driving the emergence of the Indo-Pacific regional construction. He further states, "So significant is India's rise that the notion of the Indo-Pacific as a substantial strategic concept is starting to gain traction."[26] Similarly, Hillary Clinton says, "The stretch of sea from the Indian Ocean through to the Pacific contains the world's most vibrant trade and energy roots, linking economies and driving growth", and "India straddling the waters from the Indian to the Pacific Ocean is, with us, a steward of these waterways."[27]

At a time when a vigorous debate is on over the Indo-Pacific as a strategic region, India's own position on the terminology is not clear. Yet one can try and club India's views into two major strands: remain clear of all politics surrounding the term and maintain a strategic autonomy, or adopt the inclusive approach, downplaying the China threat and allowing

25. Amb. Hemant Krishan Singh, "Reimagining the Region: "Asia-Pacific" or "Indo-Pacific"?" *ICRIER Issue Brief*, vol. 3, issue 3, October 31, 2013, p 2.
26. David Scott, "Australia's Embrace of the'Indo-Pacific': New Term, New Region, New Strategy?", http://www.d-scott.com/wp-content/uploads/2013/09/Australia-Indo-Pacific-online.pdf
27. "Hillary Clinton Urges India To Expand Influence", http://www.indiatvnews.com/print/news/hillary-clinton-urges-india-to-expand-influence-9289-1.html

for Southeast Asia to play a significant role in the region. India, on one point, worries that the challenges associated with the rise of China through the unwitting adoption of a geo-political categorisation might send a wrong, if not false, signal to other countries about India's intentions and actions. It is felt that maintaining its strategic autonomy has been an integral part of India's foreign policy and strategic objectives are best met through engagement with countries in the region, using forums such as the East Asia Summit and ASEAN, rather than through new military partnerships. On the other hand, there is a view that the Indian and Pacific Oceans constitute an 'inter-linked' space and a 'logical corollary' to the Look East policy. It is perceived that the growing strategic convergence with the USA, Australia, Japan, Indonesia and Southeast Asian countries, while, at the same time, downplaying the China threat and encouraging a "more active Russian role in the newly emerging theatre of the Indo-Pacific" will help in creating a more balanced security architecture in the region.[28]

The emergence of the Indo-Pacific concept is partly a product of the regional integration produced by the Look East and extended neighbourhood policies, and its adoption in India signals a greater focus on regional architecture-building.

The large coincidence between the geographical stretch of the Indo-Pacific and the 'areas of interest' defined by the Indian Navy in its doctrine underlie the Indian interests in the Indo-Pacific. Primary areas of interest include the Maritime Zones of India covering the territorial waters, contiguous zone and Exclusive Economic Zone (EEZ) upto 12 nm, 24 nm, and 200 nm from the national baseline and the Arabian Sea and the Bay of Bengal which largely encompass India's island territories and EEZ, and the littoral reaches. The choke points leading to, from and across, the Indian Ocean, viz. the Strait of Malacca, the Sunda Strait, the Lombok Strait, the Strait of Hormuz, Bab-el-Mandeb, the Cape of Good Hope, the Mozambique Channel, the Six Degree Channel and the Eight/Nine Degree Channels also

28. Priya Chacko, "India and the Indo-Pacific: Three Approaches", http://www.aspistrategist.org.au/2013/01/page/2/ January 24, 2013.

assume strategic importance for India. The Persian Gulf is also the source of a majority of oil supplies and is also home to a considerable population of expatriate Indians.[29] Further, the greater Indian economic interdependence stretching over the Indo-Pacific continuum motivates India to take a strong interest in the debate on the Indo-Pacific as a strategic zone of interest. All 10 leading export destinations and 9 out of 10 major import origins in the context of bilateral trade with India comprise the surrounding littoral/ island states.[30] Further, refined oil products form the largest component of Indian exports accounting for about 26.8 percent by value among the top 10 export commodities. Hence ,while India imports 70 percent of its crude requirements, it is also as much a major oil power in the export sense, making the security of its SLOCs a prime priority. It is the 3rd largest exporter (8.9 percent of global share), 4th largest producer of refined oil products (5.4 percent of global share), and has the 5th largest crude distilling capacity in the world (4.5 percent of global share).[31]

Since 1990, ideational change in India's regional polices has been seen, firstly, because of the de-legitimisation of older inward-looking economic policies and South Asia-focussed regional engagement due to multiple economic and political crises and, secondly, as a result of the emergence of new ideas about economic development that are based on India emulating and engaging states in the broader Asian region. The emergence of the Indo-Pacific concept is partly a product of the regional integration produced by the Look East and extended neighbourhood policies, and its adoption in India signals a greater focus on regional architecture-building.

29. Mishra, n. 6, p. 145.
30. Ibid., p. 151.
31. Ibid., p. 154.

IRAN'S ROLE IN THE ENERGY SECURITY OF THE CASPIAN BASIN

RAMU C M

Energy security has inarguably become an indispensible entity and occupies a significant place in contemporary geo-politics. The oil boom across the Persian Gulf in the latter part of the 20th century has culminated in a virulent race for the possession and exploitation of this precious energy resource. But of late (since the 1990s), the Caspian Sea Basin has attracted much international attention with the discovery of abundant reserves of oil and gas. As far as statistical data goes, the proven oil reserves of the entire region are less than a third of those of Iran or Iraq; the proven gas reserves are about half as much as Qatar's. In fact, taking into account the possible oil reserves, the region far outweighs the proven reserves of Saudi Arabia or those of both Iran and Iraq combined.[1] As for possible gas reserves, Turkmenistan alone has as much as the proven reserves of Saudi Arabia. Strictly speaking, the possible gas reserves of the entire Caspian Basin are comparable to those of the combined proven reserves of Saudi Arabia, Iraq and the UAE.[2]

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1. Paul Kubicek, "Energy Politics and Geopolitical Competition in the Caspian Basin", *Journal of Eurasian Studies* (Elsevier: Seoul, 2013) vol. 4, no. 2, pp. 171–180.
2. Ibid.

Table 1: Caspian Proven and Portable Offshore Reserves as of 2012[3]

Country	Crude Oil Condensate (billion bbl)	Natural Gas (trillion cf)
Azerbaijan	6.8	51
Iran	0.5	2
Kazakhstan	15.7	36
Russia	1.6	14
Turkmenistan	1.1	9
TOTAL	25.7	112

Sources: US Energy Information Administration, IHS EDIN, Eastern Bloc Research Energy Databook 2012.

Going by the trend, notwithstanding the advantage that Iran enjoys more or less as a result of its strategic geographic location at the crossroads of West, Central and South Asia, it also has the potential to emerge as a strong regional power by usurping the leverage enjoyed by the 'big three' (Russia, China and the West), in terms of serving as an exit route for the Caspian oil and gas.[4] This study will, therefore, provide some insight into the larger oil politics of the Caspian Sea Basin, focussing mainly on the inevitable role of Iran in driving the energy security of the region. It will also examine why the Iranian option is more advisable compared to the rest of the hitherto existing energy transit routes in the region.

The five Caspian littoral nations (Azerbaijan, Kazakhstan, Turkmenistan, Russia and Iran) have long been trying to evolve a consensus regarding the demarcation of their respective territorial waters and seabed exploratory rights in the Caspian Sea—the larger goal being the equitable distribution of oil and gas deposits among one another.[5] Of the five Caspian littorals,

3. Gene Kliewer, "New Caspian Developments Show High Potential", November 12, 2013, see http://www.offshore-mag.com/articles/print/volume-73/issue-11/caspian/new-caspian-developments-show-high-potential.html, accessed on June 20, 2014.
4. Daniel Sherman, "Caspian Oil and New Energy Politics", May 25, 2000, see http://www.freezerbox.com/archive/print.php?id=55, accessed on June 6, 2014.
5. Farid Rauf Oglu Shafiyev, "The Legal Regime of the Caspian Sea: View of the Littoral States", *Global Research and Analysis* (Prism, June 30, 2001) vol. 7, no. 6, see http://www.jamestown.org/single/?tx_ttnews%5Btt_news%5D=28012&tx_ttnews%5BbackPid%5D=223#.U8yz8fmSzT0, accessed on June 7, 2014.

Azerbaijan, Kazakhstan and Turkmenistan enjoy a major share in the reserves. But, the disadvantage of being landlocked has invariably forced them to depend on neighbours (nations with ports having access to the world's oil markets) for exporting their produce. Till recently, Russia alone had supplied the energy transit for the Caspian oil and gas; but now, the West [the US and the European Union (EU), with support from regional allies like Turkey and Georgia] as well as China have also come on a level-playing field with the former.[6] It is in this regard that Iran acquires an important role in providing a viable solution to the dilemma involved in transporting Caspian energy to its global customers.

Iran's geographical location is both economically and strategically significant since it serves as a bridge connecting the landlocked Caspian Sea with the Persian Gulf and the Arabian Sea (part of the larger Indian Ocean). With the exception of Azerbaijan (with which it has had pulsating trade relations due to the former's predominantly pro-Western inclination,[7] and due to ethno-cultural issues[8]), both Kazakhstan and Turkmenistan enjoy excellent economic linkages with Iran. Such strong trade ties have had a larger beneficiary, say, for example, in a major oil importer like China. China has always remained cautious when confronted with the question of constructing pipelines from Central Asia to its territory. The issue becomes problematic for the pipelines have to pass through rugged terrain (the Tien Shan mountain range) and certain conflict-prone regions (like the restive Xinjiang province). Although China went on to construct oil and gas pipelines from Kazakhstan and Turkmenistan respectively, the ever-looming threat of sabotage (by Uighur separatist rebels) persists. Such fears have been addressed to a considerable extent by the 'oil swap' agreement inked in 1997, between Iran and the Caspian trio (with Kazakhstan and Turkmenistan initially taking a more proactive role, compared to a West-

6. Kubicek, n.1, pp. 171–180.
7. Ariel Farrar-Wellman, "Azerbaijan-Iran Foreign Relations", April 8, 2010, see http://www.irantracker.org/foreign-relations/azerbaijan-iran-foreign-relations, accessed on June 6, 2014
8. "Iran- Azerbaijani Relations in 2013: Decrease in Trade, Border Clashes, Cultural Wars'', December 28, 2013, see http://www.panorama.am/en/interviews/2013/12/28/a-israyelyan/, accessed on June 10,2014.

Recent findings have confirmed that the Caspian region, as a whole, contains some of the most abundant hydrocarbon reserves outside the already well-exploited Persian Gulf region. In this context, the region has witnessed, and perhaps has been witnessing, a tussle among major players in gaining a foothold over its vastly untapped energy wealth.

leaning Azerbaijan).[9]

Under the arrangement, the oil from the three Caspian littorals is taken to the refineries in northern Iran (Tehran, Tabriz and Arak). The refined products are used within the country to meet its ever-increasing domestic energy demand. In the meanwhile, Iran exports an equal share of its crude (from the oil fields in the south/south-west) via its terminals along the Persian Gulf, the Sea of Oman and the Arabian Sea (for example, Bushehr, Kharg Island, Bandar-e-Abbas, Jask and Chahbahar), to the energy-hungry Asian consumers as well as the Western markets.[10] As a result, Iran has managed to circumvent the logistical hurdles in transporting its crude (in the south), all the way to the refineries in the north. Moreover, a win-win situation is created, wherein the supplier, intermediary and customer are at an advantageous position. As a matter of fact, analysts agree that Iran represents the best route for energy transfer in the region, as this route is shorter and less costly than the Russia, Turkey and China routes.[11] Nevertheless, the energy-rich Caspian states would obviously prefer to cooperate with Iran, rather than bowing down to the suzerainty of the 'big three' (Russia, the West and China).

Recent findings have confirmed that the Caspian region, as a whole, contains some of the most abundant hydrocarbon reserves outside the

9. "Iran Resumes Oil-Swap", *The Moscow Times* (Moscow), November 15, 1997, see http://www.themoscowtimes.com/sitemap/paid/1997/11/article/iran-resumes-oil-swap/297473.html, accessed on June 7, 2014.
10. "Oil-Swaps", The British Iranian Chamber of Commerce, see http://www.bicc.org.uk/in-iran.html, accessed on June 5, 2014.
11. "Iranian Options Most Economically Viable for Exporting Caspian Oil", *Oil & Gas Journal*, March 17, 2003, see http://www.ogj.com/articles/print/volume-101/issue-11/general-interest/iranian-options-most-economically-viable-for-exporting-caspian-oil.html, accessed on June 6, 2014.

already well-exploited Persian Gulf region. In this context, the region has witnessed, and perhaps has been witnessing a tussle among major players in gaining a foothold over its vastly untapped energy wealth.[12] Contrary to the 'big three', Iran has adopted a more accommodative posturing towards the Caspian oil-producing trio by conforming to the 'oil swap' agreement. After being at the receiving end of a prolonged spell of criticism and punitive sanctions from the West, Iran's strategic advantage in this regard will certainly force its adversaries to shun their anti-Iran rhetoric. And, most importantly, Iran could gradually lessen its dependence on other countries for finished petroleum products, which is all the more important considering the difficulty it faces in transporting its crude from the south to the refineries in the north. Nonetheless, if taken up and pursued in a more proactive manner, the 'oil swap' arrangement could provide a way out for Iran, with respect to the sanctions in the transfer of technology (which have curtailed its ability to construct a sufficient number of refineries in close proximity to its oil wells in the south).

Iran could gradually lessen its dependence on other countries for finished petroleum products, which is all the more important considering the difficulty it faces in transporting its crude from the south to the refineries in the north.

The safe conduit of the Caspian oil and gas has been of utmost priority to both the Caspian trio and its end users across the world. Once again, this has inarguably led to intense competition among the governments and associated oil giants of foreign players, for gaining leverage as the preferred carriers of the Caspian oil and gas to world markets. Both Azerbaijan and Kazakhstan have so far been able to maintain a balance in allocating their oil fields equitably among the Russian, Chinese and Western oil companies. Turkmenistan, under its former President Niyazov, had been initially reluctant to invite foreign tenders (especially from the West and China); but since 2005 (under Gurbanguly Berdimuhamedow), has been actively negotiating with Chinese companies. To that degree, a gas pipeline

12. Kubicek, n. 1, pp. 171–180.

Whereas Russia (rigorously pursuing an energy-driven economic resurgence under strongman Putin) vehemently tried to restrict the energy conduit through its already-existing vast network of pipelines (constructed during the Soviet times), there were fruitful as well as futile attempts by the West to reduce its dependence on the Russian transit network.

was successfully constructed, taking Turkmen gas to the Xinjiang province of China via Uzbekistan and Kazakhstan.[13]

In the early 1990s, following the collapse of the Soviet Union, Russia was more focussed on reconstructing its shattered economy, and, hence, was negligent about the problems faced by the CIS (Commonwealth of Independent States).[14] The Caspian nations were in dire need of technological investment, in order to exploit their potential oil wealth.[15] The Western oil giants—the likes of Chevron, BP, Shell, Exxon Mobil, Eni and so on—were spot on to grab hold of this golden opportunity. Agreements were signed for the prospecting and drilling of oil in the Kashagan and Tengiz oil fields of Kazakhstan and the Shah Deniz oil fields of Azerbaijan.[16] However, rather than extraction and refining of oil, it was a question of transporting the extracted produce to the end users, which posed a serious challenge to the recipient nations and participating conglomerates.

Whereas Russia (rigorously pursuing an energy-driven economic resurgence under strongman Putin) vehemently tried to restrict the energy conduit through its already-existing vast network of pipelines (constructed during the Soviet times), there were fruitful as well as futile attempts by the West to reduce its dependence on the Russian transit network. Azerbaijan,

13. BBC Monitoring Research in English July 25, 2007 BBC Monitoring Central Asia, "ANALYSIS: Turkmen Gas Deal Extends Chinese Influence", *Central & Southern Asia Pipelines News*, July 25, 2007, see http://www.downstreamtoday.com/news/article.aspx?a_id=5015&AspxAutoDetectCookieSupport=1, accessed on June 9, 2014.
14. Irina Zviagelskaia, *The Russian Policy Debate on Central Asia* (Royal Institute of International Affairs: London, 1995).
15. Kubicek, n.1, pp. 171–180.
16. Vadim Rubin, "The Geopolitics of Energy Development in the Caspian Region: Regional Cooperation or Conflict?", Centre for International Security and Cooperation Conference Report (IIS: Stanford, 1999), see http://www.stanford.edu/group/CISAC/, accessed on June 8, 2014.

especially vis-à-vis its geography, was more open to the Western agenda of "inducing greater diversity" to the Caspian pipeline network.[17] Soon, China also forayed into the Caspian energy scramble. Initially, it seemed as though China simply wanted to grab a piece of the pie; however, with an actively opportunistic outlook, excellent diplomatic manoeuvring and a business-as-usual approach, it has certainly been taking giant leaps amidst the consistent locking of horns between the Russians and the West.[18]

To curtail the Russian energy-transit monopoly over the Caspian oil, Turkey took up the issue of congestion in the straits by the ever-increasing shipping traffic (posing danger to its largest and most populous city, Istanbul). The Russian response was a proposal to build a pipeline from the Bulgarian Black Sea port of Burgas to the Greek Aegean port of Alexandroupolis.

Presently, a large number of pipelines transport the Caspian oil to its worldwide consumers. While a majority of these goes northward criss-crossing the Russian Caucasus, increased Western and Chinese intervention has ensured the proliferation of pipelines both westward as well as eastward. Needless to say, Russia still exercises a monopoly over the old Soviet pipeline infrastructure traversing the North-South Caucasian corridor. The Northern Route, constituting the Baku-Grozny- Tikhoretsk-Novorossiysk oil pipeline, is the handiwork of the Caspian Pipeline Consortium (in which the Russian oil giant, Transneft is the major stakeholder). It takes oil from the Sangachal terminal (near Baku) to the Novorossiysk terminal in the Russian Black Sea coast. It would then be shipped to the end users in the West and elsewhere, moving from the Black Sea into the Mediterranean through the Straits of Bosphorus and Dardanelles (Turkey).[19] To curtail the Russian energy-transit monopoly

17. Peter Rutland, "Oil, Politics and Foreign Policy", in David Lane, ed., *The Political Economy of Russian Oil* (Rowman and Littlefield: Latham 1999).
18. Mark Berniker, "China's Hunger for Central Asian Energy", *Asia Times Online*, June 11, 2003, see http://www.atimes.com/atimes/Central_Asia/EF11Ag01.html, accessed on June 9, 2014.
19. Andrei Shoumikhin, "Russia: Developing Cooperation on the Caspian", in Michael P Croissant and Bulent Aras, eds., *Oil and Geopolitics in the Caspian Sea Region* (US: PraegerPublishers: 1999) pp. 131-154.

over the Caspian oil, Turkey took up the issue of congestion in the straits by the ever-increasing shipping traffic (posing danger to its largest and most populous city, Istanbul). The Russian response was a proposal to build a pipeline from the Bulgarian Black Sea port of Burgas to the Greek Aegean port of Alexandroupolis (referred to as the Trans-Balkan pipeline), thereby bypassing the straits.[20] However, with the withdrawal of Bulgaria from the plan, the project so far remains in the doldrums.[21]

The West's desire for a dominant stake in the Caspian energy transit was realised with the commissioning of the Baku-Tbilisi-Supsa oil pipeline, connecting the Sangachal terminal to the Supsa terminal (a western Georgian Black Sea port). From Supsa, the oil would be shipped to the southern Ukrainian port city of Odessa; from where it would be transported to Brody (in the Ukraine-Poland border) via the Odessa-Brody oil pipeline.[22] But, without doubt, a significant achievement in the oil transit through the Western Route was the establishment of the Baku-Tbilisi-Ceyhan (BTC) oil pipeline. The BTC pipeline (or main export pipeline, as it is called) terminates at the Ceyhan terminal, a southeastern Turkish Mediterranean coastal city. Further, the BTC consortium boasted of an enthralling conglomeration of eleven multinational oil companies.[23] Moreover, a proposal has been floated to construct an undersea Trans-Caspian pipeline, to link the Kazakh and Turkmen oil fields and terminals in the eastern Caspian coast with a number of tributary pipelines in the western coast; and, finally, connecting to the BTC pipeline. However, the above idea has been marred by criticism pertaining to the adverse environmental impacts of such an undertaking.[24]

20. "Project Overview", see http://www.tbpipeline.com/, accessed on June 15, 2014.
21. "Bulgaria Abandons Burgas-Alexandroupoli Oil Pipeline Plan", February 6, 2013, see http://www.ekathimerini.com/4dcgi/_w_articles_wsite2_1_06/02/2013_482321, accessed on June 12, 2014.
22. Emil Souleimanov and Filip Černý, "The Southern Caucasus Pipelines and the Caspian 'Oil Diplomacy: The Issue of Transporting Caspian Oil and Natural Gas to World Markets", 2012, vol. 11, no. 4, pp. 81-84, see www.usc.es/revistas/index.php/rips/article/download/696/690, accessed on June 24, 2014.
23. Ibid., pp. 87-91.
24. "Trans-Caspian Pipelines – Ecological Concerns of Turkmenistan...," *The Free Library, 2011 Al Bawaba (Middle East) Ltd.*, July 21, 2014, see http://www.thefreelibrary.com/Trans-Caspian+Pipelines+--+Ecological+Concerns+of+Turkmenistan.-a0250749847, accessed on June 17, 2014.

The Chinese footprint in the Caspian oil trade became pronounced towards the close of the 20th century. Over the past decade, the China National Petroleum Corporation (CNPC) has invested heavily in the Caspian off-shore and on-shore oil and gas fields of Kazakhstan and Turkmenistan respectively. The Kazakhstan-China oil pipeline and the Trans-Asia gas pipeline (taking Turkmen gas through Uzbekistan and Kazakhstan to Xinjiang), are by far, the best examples of China's inroads into the Caspian energy trade. As a matter of fact, these ventures come under the ambit of China's ambitious "Reviving the Ancient Silk Route" programme.[25]

Fig 1[26]

Source: "Turkmenistan", *ANALYSIS BRIEFS*, January 25, 2012, see http://www.eia.gov/countries/cab.cfm?fips=TX

25. n.13.
26. "Turkmenistan", *ANALYSIS BRIEFS*, January 25, 2012, see http://www.eia.gov/countries/cab.cfm?fips=TX, accessed on June 12, 2014.

Despite the incessant competition among the major players for a monopoly over the control of the Caspian energy transit, their efforts are not devoid of stumbling blocks. Say, for example, all the three pipeline routes, be it the Northern (Russia-dominated), Western (US/EU/Turkey-dominated) or Eastern (China-dominated), have to traverse considerably long distances, running through uncharted territories consisting of rugged terrain and volatile conflict-prone regions. In fact, the Russian pipeline network along the Northern Route passes in close proximity to the Chechen Autonomous Region and Dagestan Republic, regions which have witnessed violence since the First Chechen War of 1994.[27] Moreover, some of the pipelines in the Russian territory (those built during the Soviet era) have come under heavy criticism for being obsolete, and, therefore, non-resistant to corrosion. To that extent, Russia had initially refused to transport Kazakh oil through some of its pipelines, citing excess sulfur content in the oil.[28] Neither is the Western Route bereft of hurdles. It passes through the Nagorno-Karabakh region, which has seen violent ethnic clashes between the Karabakhi Armenians and the Azerbaijani state. Nonetheless, the BTC pipeline goes through southeastern Turkey, where the Kurdistan Workers' Party (KPP) has long been waging a turf-war against the Turkish government forces, demanding secession and establishment of an independent state. To add to the woes, the pro-Russian breakaway provinces of South Ossetia and Abkhazia pose a threat to the safety of the Baku-Tbilisi-Supsa pipeline in Georgia.[29] And as said earlier, the proposal for a Trans-Caspian undersea pipeline has come under the scanner for possible environmental degradation and sea water contamination. (The pipeline, if supposedly ruptured, could release poisonous hydrogen sulfide gas into marine and coastal life).[30]

27. Adam Rodriguez, "Oil Export for a Unified Caspian Oil Conglomerate", Autumn 2002, see http://web.stanford.edu/class/e297a/Unified%20Oil%20Conglomerate.htm, accessed on June 8, 2014.
28. Kubicek, n.1, pp. 171–180.
29. Rodriguez, n.27.
30. n. 24..

As with the Eastern Route, the Tien-Shan mountain system poses a huge challenge to the safety of the pipelines. On the one hand, the region is prone to earthquakes (it is situated in a seismically-active belt where the Indian plate continuously pushes onto the Eurasian continental plate); and on the other, besides the construction costs, even maintenance of the pipelines in such difficult-to-access rugged topography involves massive expenditure.[31]

In addition to all these factors, corrupt practices on the part of both the government regimes and oil companies in awarding/winning tenders have hindered all-round progress. This has been rather critically reflected in the inability of the host governments to sustain the financing of the pipelines over a long period of time. For example, the US, which paid a whopping $200 million in subsidies for the construction of the BTC pipeline, remains concerned over the ability of the Azeri government in financing and overseeing the maintenance of the pipeline.[32]

Having taken into account the above-mentioned constraints, Iran enjoys the position to take advantage of the situation. Several surveys and feasibility studies conducted till date, have confirmed that the Iranian Route offers the safest, and perhaps the most cost-effective, option for transporting the Caspian oil to its end users.[33] As stated earlier, a more active pursuit of the oil-swap agreement would enable Iran to eventually realise its long-awaited goal of attaining self-reliance and self-sufficiency in meeting its burgeoning demand for energy. Add to this, the cost-effectiveness and a relatively better safety guarantee that is ensured in the process. Likewise, any increase in oil-swaps can be comprehended with the construction of a trans-Iranian pipeline for the transit of the Caspian oil and linking it to

31. "China's Central Asia Problem", International Crisis Group Asia Report (ICG: Brussels, February 27, 2013), see http://www.crisisgroup.org/~/media/Files/asia/north-east-asia/244-chinas-central-asia-problem.pdf, accessed on June 7, 2014.
32. Hossein Askari and Roshanak Taghavi, "Iran's Financial Stake in Caspian Oil", *British Journal of Middle Eastern Studies* (Taylor & Francis Ltd, May 2006), vol. 33, no. 1, pp. 1-18, see http://www.jstor.org/stable/20455422, accessed on June 12, 2014.
33. "Iranian Options Most Economically Viable for Exporting Caspian Oil", *Oil & Gas Journal*, March 17, 2003, see http://www.ogj.com/articles/print/volume-101/issue-11/general-interest/iranian-options-most-economically-viable-for-exporting-caspian-oil.html, accessed on June 6, 2014.

the already existing pipeline network within Iran.[34] Fortunately, Iran has a well-connected railway network cutting across its northern frontier. This could serve as a direct linkage between its Caspian Sea ports and the major refineries. For instance, the crude shipped from the Caspian oil terminals to the Iranian Caspian sea ports of Neka and Amirabad, is taken to the major refineries in Tabriz, Tehran and Arak in oil tankers (through rail); which is a testimony to the well-equipped railway network (suffice to remember that there is already a pipeline network in this route).[35]

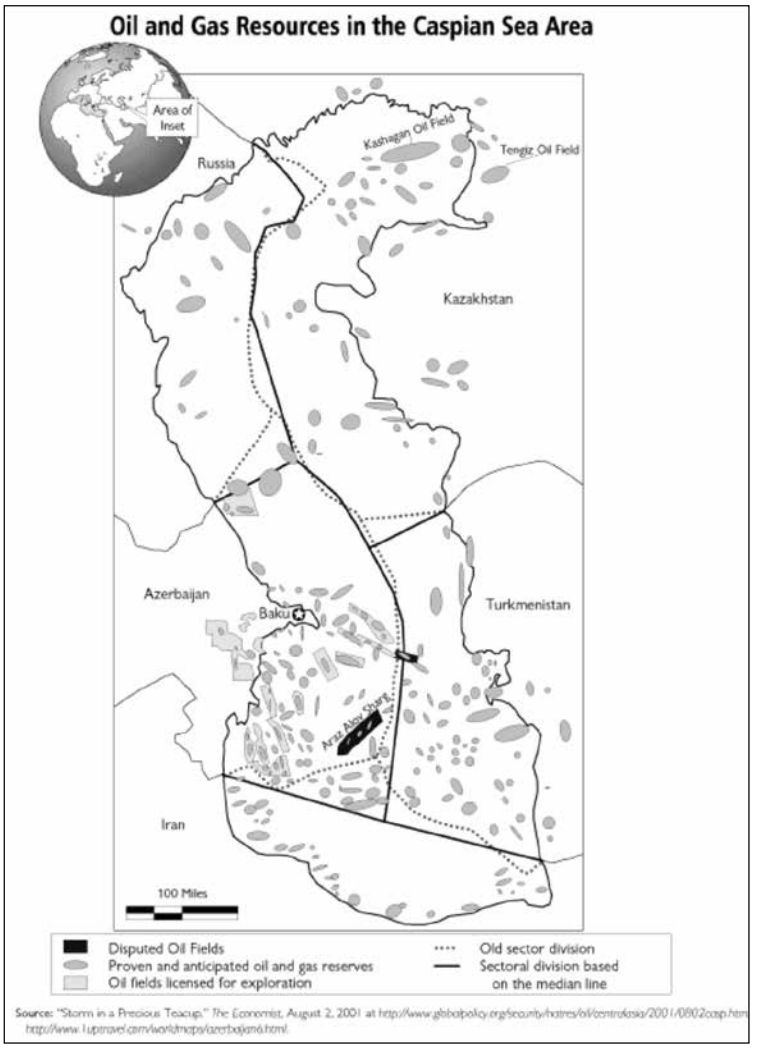
To properly understand Iran's intentions and priorities in the Caspian Basin, it is necessary to provide an insight into the dilemma surrounding the legal status of the water body; plus the contentions over its territorial (seabed) demarcation among the Caspian littorals. Various agreements signed in 1921, 1935 and 1941 respectively between Iran and the then USSR, recognised the Caspian Sea as an inland lake (a claim disputed by the West) over which both nations had joint rights. This was reiterated in the Almaty Conference of December 1991 (by then, the USSR had split into four states). Accordingly, the international obligations to which both Iran and the USSR were subject to, would also apply to the three new Central Asian states plus Russia.[36] According to this agreement, the littorals would form a 'condominium' and jointly prospect for oil in the Caspian Basin. Moreover, each state had the power to veto any proposal; due to which it would be difficult to evolve a consensus. Iran supports the 'condominium method', as it stands to benefit from the overall mechanism: not only would it gain from the oil and gas production but also from levying transit fees and oil-swap charges for transporting the Caspian oil through its territory (either through pipelines or as oil-swaps). For this reason, Iran even suggested the formation of a "Caspian Oil and Gas Company", which would be jointly owned by the five littoral countries. To that effect, Iran officially put forth its objective of forming a "Council of Caspian Sea Countries".[37]

34. Askari and Taghavi, n. 32, pp. 1-18.
35. "Neka-Ray Crude-Oil Pipeline Pumping Stations and Related Installations", see http://www.kayson-ir.com/project.aspx?name=nekaray&cat=energy, accessed on June 17, 2014.
36. Askari and Taghavi, n. 32, pp. 1-18.
37. Ibid.

However, not long after the Almaty Conference, there came up talks of dividing the seabed in consonance with the "Modified Median Line Principle" (MMLP). Accordingly, the seabed ought to be divided using median lines, i.e. lines equidistant from the closest mainland points of each of the two countries. Further, any deposits and structures falling along the median line would be divided equally between both countries, even if there are more on one side of the line than on the other.[38] In this regard, Kazakhstan and Azerbaijan agreed to adopt this mechanism, until there could be a consensus on the legal status of the Caspian Sea. Soon after, Turkmenistan also came into the picture, agreeing to conform to the median line method. In a similar development (in July 1998), Russia forged a bilateral agreement with Kazakhstan, deciding to divide the Northern Caspian seabed along median lines; yet maintaining dual ownership of its waters. As per the arrangement, whereas the seabed was to be divided, the surface waters were to be mutually shared between both countries for economic activities like fishing, shipping, etc. Following the MMLP meant that Kazakhstan would get 28.4 percent of the seabed, Azerbaijan 21 percent, Russia 19 percent, Turkmenistan 18 percent; and Iran would end up as the sore loser with just 13.6 percent of the seabed.[39]

38. Ibid.
39. Ibid.

Fig 2[40]



Iran, therefore, raised its protest, calling for an equal division of the seabed among the five littorals. In fact, the Iranians were not willing to agree to any arrangement that would fetch them less than 20 percent ownership of the seabed. However, it is to be strictly noted that the above division had no

40. Aerial Cohen, "Iran's Claim over Caspian Sea Resources Threaten Energy Security", September 5, 2002, see http://www.heritage.org/research/reports/2002/09/irans-claim-over-caspian-sea-resources-threaten-energy-security, accessed on June 14, 2014.

credibility, since in practical terms, the Caspian Basin could not be uniformly divided amongst the five nations: primarily, it had no definite geographical shape; and secondly, such a division would amount to possible overlapping of boundaries. As a consequence, Iran's assertion was rejected outright by the rest of the countries.[41] Soon, Turkmenistan followed suit, calling for certain amendments in the MMLP. For Turkmenistan, in addition to the division of the seabed into different sectors along median lines, each sector was to encompass an area extending up to 45 miles of the width of the adjoining median line, inside which the respective state shall have exclusive rights. Subsequently, Kazakhstan would get 26.8 percent of the seabed, Azerbaijan 12.7 percent, Russia 12.9 percent, Turkmenistan 12 percent; and Iran having to once again settle for a mere 10 percent. Additionally, the jointly shared area would increase to 25.5 percent.[42] This time, it was Azerbaijan which came up with resentment. The Azeris were justified in their action, as they risked losing a large share of the seabed (which had been guaranteed to them under the MMLP). Moreover, both Azerbaijan and Turkmenistan had (and continue to have) differing claims over the territoriality of the Kapaz/ Sardar oil field.[43]

Notwithstanding reservations from Iran and Turkmenistan, the MMLP has hitherto fared better compared to the several suggestions that were made in regard to the division of the Caspian seabed.

Notwithstanding reservations from Iran and Turkmenistan, the MMLP has hitherto fared better compared to the several suggestions that were made in regard to the division of the Caspian seabed. The main reason behind this is its acceptance by the majority: Russia, Kazakhstan, Azerbaijan, and to an extent, Turkmenistan (succumbing to fatalism). Regardless of their ulterior motives, each country's action has its own rationale. Russia, by means of joint ownership of the territorial waters (not the seabed), seeks to

41. Hooshang Amirahmadi, "Challenges of the Caspian Region", in Hooshang Amirahmadi, ed., *The Caspian Region at a Crossroad: Challenges of a New Frontier of Energy and Development* (New York: St. Martin's Press, 2000), pp. 1-25.
42. Ibid.
43. Ibid.

The lack of consensus among the littorals, formerly over the disputed legal status of the Caspian (sea or lake?) and subsequently over the demarcation of the seabed, manifested in a series of summits of the heads of the Caspian Sea littoral states; the latest of which was held in Baku, in 2010.

serve its own agenda of having a mobilised naval presence in the Caspian. Kazakhstan has often been obliged to conform to the Russian viewpoint for the following factors: it is dependent on Russia for military aid, it harbours a 35 percent Russian (Slavic) minority in the north, who virtually enjoy a monopoly in the movement of essential food grains; and lastly, 55 percent of Kazakhstan's imports come from Russia.[44] One cannot brush aside the fact that Kazakhstan is the biggest beneficiary of the MMLP. As for Azerbaijan, by endorsing the MMLP, it has managed to walk the tightrope between Russian hegemony and an enterprising USA. Unlike its Central Asian counterparts, Turkmenistan chose a more balanced and pragmatic stance, siding with Iran on the uniform distribution of the Caspian Basin; while simultaneously consenting to endorse the MMLP if the '45 mile' recommendation is given due consideration.[45]

The lack of consensus among the littorals, formerly over the disputed legal status of the Caspian (sea or lake?) and subsequently over the demarcation of the seabed, manifested in a series of summits of the heads of the Caspian Sea littoral states; the latest of which was held in Baku, in 2010. On a brighter note, in a meeting of foreign ministers of Caspian littorals convened in Moscow recently (April 22, 2014), Iranian Foreign Minister Javed Zarif spoke of ensuring "sustainable peace in the Caspian Sea region for the economic development and prosperity of its people".[46] The next summit of the heads of the Caspian littorals (the fourth such summit, till date) will take place in the Russian Caspian port city of Astrakhan, later

44. Ibid.
45. Ibid.
46. "Iran FM Urges Lasting Peace in Caspian Sea", April 22, 2014, see http://www.presstv.in/detail/2014/04/22/359639/iran-urges-lasting-peace-in-caspian-sea/, accessed on June 28, 2014.

this year.[47] Throwing light on the praiseworthy advances made by the Rouhani regime in improving relations with its Caspian littoral counterparts (especially Azerbaijan),[48] hopes remain high over the expeditious settlement of the important and immediate regional issues.

By all accounts, the need of the hour is a proactive energy diplomacy initiative from Iran. Considering the stalemate that the Caspian littorals have intentionally or inadvertently put themselves in, the time is ripe for reconciliatory measures aimed at steering themselves out of the quagmire. Nevertheless, even if the MMLP is adopted as the only practical solution to a proportionate division of the Caspian seabed, the fact of the matter is that Iran would be able to exploit 17 percent of the seabed (which includes the area that coincides with the median lines, separating the Iranian sector from those of Azerbaijan and Turkmenistan respectively).[49] However, the most important are the benefits that could arise from Iran taking up the role of the primary energy transit provider for the Caspian oil and gas. Strictly speaking, Iran needs to enhance and expedite its oil-swaps with the trio. Besides this, all possible options for the construction of a trans-Iranian pipeline ought to be given utmost priority.

The trans-Iranian pipeline, once operational, would connect the Iranian Caspian Sea port of Neka in the north to the southern Persian Gulf port of Jask, adjoining the Sea of Oman.[50] In a series of constructive developments, the National Iranian Oil Company signed a contract agreement with a South Korean company for the construction of the 1,680-km-long pipeline (October 7, 2011).[51] This comes as no surprise, considering the fact that South Korea is among the leading importers of Iranian oil. Moreover, the trans-Iranian pipeline would facilitate the oil-swaps with the Caspian triumvirate. Thereby, with a conducive and well-supported infrastructure and logistics base, the

47. Ibid.
48. Stephen Blank, "Is an Irano-Azerbaijani Rapprochement Taking Place?", May 21, 2014, see http://www.cacianalyst.org/publications/analytical-articles/item/12980-is-an-irano-azerbaijani-rapprochement-taking-place?.html, accessed on June 30, 2014.
49. Askari and Taghavi, n.32, pp. 1-18.
50. Ibid.
51. "S Korea Signs on to Trans-Iran Pipeline", October 7, 2011, see http://edition.presstv.ir/detail/203348.html, accessed on June 30, 2014.

Iranian government can confidently vouch for an increase in the volume of oil-swaps with the Caspian trio. The Rouhani Administration has already been engaging in some active energy diplomacy; specially in appealing for a hike in the volume of the Central Asian crude oil, which is shipped (in barrels) in oil tankers to the port of Neka.[52] Not to mention the fact that starting July 2, 2011, the oil-swaps resumed in full swing after an unwarranted year-long hiatus.[53] In another rather surprising development, even Russia seems to have come to terms with the overall sustainability and preference for the Iranian oil-swap arrangement. In October last year, during a visit to Moscow, the Iranian Oil Minister Bijan Namdar Zanganeh discussed the possibility of conducting oil-swaps, with Russian officials. Hence, there is every possibility that Russia may also soon follow the Caspian trio in forging an oil-swap deal with Iran.[54] If it materialises, this will be considered a wiser move on the part of Russia: because, on the one hand, it has abundant, (or for that matter), a majority, of its hydrocarbon deposits/fields, in areas other than the Caspian region; whereas, on the other, it already enjoys a monopoly over its vast network of pipelines supplying oil and gas from these fields to the markets of Western Europe and East Asia.[55]

As has been pointed out so far, though Iran can boast of its credentials as a major exporter of crude oil, the unilateral sanctions of the US have curtailed its ability to export let alone make optimal use of its abundant natural gas reserves (the second largest in the world, after Russia[56]). The stringent punitive sanctions over the transfer of technology have resulted in Iran not being able to convert its huge stockpiles of natural gas into liquefied form, or LNG (Liquefied

52. Arron Merat, "Rouhani's Central Asia Policies in Spotlight at SCO Summit", September 15, 2013, see http://www.al-monitor.com/pulse/tr/originals/2013/09/rouhani-central-asia-policy-at-sco-summit.html, accessed on June 29, 2014.
53. "NIOC to Allow Oil Swap by Private Sector", November 9, 2011, see http://www.presstv.in/detail/209235.html, accessed on June 24, 2014.
54. "Iran, Russia May Ink Crude Oil Swap Deal: Report", October 30, 2013, see http://tehrantimes.com/economy-and-business/111822-iran-russia-may-ink-crude-oil-swap-deal-report, accessed on June 20,2014.
55. "Russia may Become World's Leader in Oil Reserves – Russian Minister", February 19, 2014, see http://voiceofrussia.com/2014_02_19/Russia-may-become-world-s-leader-in-oil-reserves-Russian-minister-0808/, accessed on June 30, 2014.
56. "Iran: Country Analysis Brief Overview", May 30, 2013, see http://www.eia.gov/countries/country-data.cfm?fips=ir, accessed on June 19, 2014.

Natural Gas); which is the domestically usable form of natural gas. Not to forget, conversion into LNG is the only viable method for transporting gas in oil tankers; especially for supply to the eastern markets like India and the Far Eastern markets of Asia (like China, South Korea and Japan). But recently (in March 2014), in the process of reducing its unprecedented dependence on gas imports (which is very unfortunate and shocking for a country with the world's second largest gas reserves), Iran entered into an agreement with the Sultanate of Oman. As per the deal, Iran would export LNG to the Asian markets, via an LNG plant/terminal in Oman. The Omani oil tankers would then ship the processed gas to the Asian consumers. Both countries have already proposed to build a gas pipeline for transporting Iranian gas from its southern gas fields (mainly the South Pars gas fields) to the Omani LNG terminal.[57] This would further incentivise Iran to also canvass with the Caspian trio for more gas-swap agreements.

Besides the LNG option, Iran already exports natural gas *per se* to its consumer nations, via pipelines. However, its hitherto existing pipelines extend only till neighbouring Iraq and Turkey. Therefore, in order to realise its potential as a leading gas exporter, Iran is forced to further extend its pipeline dominance to the gas-thirsty markets in Europe and (South and East) Asia. Luckily for Iran, the recent Ukrainian imbroglio and the Russian threat of blocking gas supply to Europe (in response to the sanctions), have forced the Europeans to reduce dependence on Russian gas and look for alternatives.[58] In this regard, Iran has virtually capitalised on the unfolding situation. A Persian pipeline (the Iran-Turkey-Europe gas pipeline) has been proposed to directly connect the South Pars gas fields to Europe, traversing countries like Turkey, Greece, Italy, Switzerland, Austria, France and Spain.[59] Coinciding with these developments, during last November, Iran finally managed to negotiate an interim deal, with the P5+1 countries, for a

57. Benoît Faucon, "Iran Considering Exporting LNG via Plant in Oman", *The Wall Street Journal* (Middle East News), March 17, 2014, see http://online.wsj.com/news/articles/SB10001424052702303287804579445373706670940, accessed on June 23, 2014.
58. "Iran Ready to Supply Europe with Natural Gas: Official", May 8, 2014, see http://www.presstv.com/detail/2014/05/08/361803/iran-ready-to-export-gas-to-europe/, accessed on June 27, 2014.
59. "Iran Starts Persian Gas Pipeline Construction", May 30, 2009, see http://edition.presstv.ir/detail/96451.html, accessed on June 21, 2014.

temporary reduction in economic sanctions, in exchange for its agreeing to reduce its uranium enrichment level to below 20 percent; and allowing the International Atomic Energy Agency (IAEA) access to its nuclear facilities. With the gestation period (provided for meeting the obligatory clauses) set to expire on November 24, 2014, (extended from the initial deadline of July 20), pragmatists and neo-liberals across the world are expecting committed and calculated measures from both sides.[60] Hopefully, with the eventual lifting of sanctions (a process already underway, albeit at a snail's pace), Iran could invite increased participation from foreign companies to develop the necessary infrastructure for oil and gas production/transportation.

Fig 3[61]

Source: "Turkmenistan", *ANALYSIS BRIEFS*, January 25, 2012, see http://www.eia.gov/countries/cab.cfm?fips=TX

60. Mick Krever and Joshua Berlinger, "Nations Agree to 4-Month Extension of Iranian NuclearNegotiations", July 21, 2014, see http://edition.cnn.com/2014/07/19/world/meast/iran-nuclear-negotiations-extension/, accessed on July 22, 2014.
61. "Turkmenistan", *ANALYSIS BRIEFS*, January 25, 2012, see http://www.eia.gov/countries/cab.cfm?fips=TX, accessed on June 12, 2014.

With regard to the proposed Persian gas pipeline, Iran remains confident of bringing in Chinese participation, considering the fact that China is the largest beneficiary of Iran's crude oil exports; plus the largest foreign investor in Iran's technical infrastructure.[62] Regretfully, back in 2010, a Swiss company had pulled out from the proposed project, fearing US sanctions.[63] However, assuming the possibility of an all-pervading thaw in relations between Iran and the West, the project is expected to be revived. Once operational, it will serve as a more cost-efficient alternative to the already proposed Nabucco pipeline connecting Azerbaijan to Central Europe via Turkey, Bulgaria, Romania, Hungary and Austria.[64] Additionally, the idea of an Iran-Iraq-Syria gas pipeline was also floated. However, in spite of the preliminary construction work on the pipeline; the project was put on the back-burner, following the Syrian "Civil War".[65]

Notwithstanding the demand for its gas in the West (Europe), Iran has kept keen eyes on the Asian markets too. India is the biggest consumer of Iranian crude, after China.[66] Currently, India has refrained from committing itself to the proposed Iran-Pakistan-India (IPI) gas pipeline (citing its transit through the volatile conflict-prone provinces of Baluchistan and Sindh). But seeing a possible win-win outcome in such a venture, Iran has even offered to re-route the pipeline by bypassing Pakistani territory (instead taking it through the off-shore/sub-sea Pakistani continental shelf).[67] In return, Iran expects India to hike its crude oil purchases to pre-sanction levels.

62. Natalie Coomber, "Standing Up Against Nabucco", July 14, 2009, see http://www.hydrocarbons-technology.com/features/feature59516/, accessed on June 16, 2014.
63. Benjamin Weinthal, "Swiss Adopt EU Sanctions on Teheran", January 26, 2011, see http://www.jpost.com/Iranian-Threat/News/Swiss-adopt-EU-sanctions-on-Teheran, accessed on June 25, 2014.
64. "Iran Plans Gas Link to Europe Distinct from Nabucco", *Reuters*, October 19, 2008, see http://company9688.ecasb.com/en/news/87, accessed on June 24, 2014.
65. Dmitry Minin, "The Geopolitics of Gas and the Syrian Crisis: Syrian "Opposition," Armed to Thwart Construction of Iran-Iraq-Syria Gas Pipeline", June 3, 2013, see http://www.globalresearch.ca/the-geopolitics-of-gas-and-the-syrian-crisis-syrian-opposition-armed-to-thwart-construction-of-iran-iraq-syria-gas-pipeline/5337452, accessed on June 28, 2014.
66. "India's January-June Iran Oil Imports Climb by a Third", July 23, 2014, see http://economictimes.indiatimes.com/industry/energy/oil-gas/indias-january-june-iran-oil-imports-climb-by-a-third/articleshow/38923129.cms, accessed on July 24, 2014.
67. Amitav Ranjan, "Buy More Oil Will Re-route Pipeline: Iran", May 22, 2013, see http://archive.indianexpress.com/news/buy-more-oil-will-reroute-pipeline-iran/1118948/, accessed on June 17, 2014.

With the Iranian transit route outweighing the other West-owned pipeline routes (like the BTC) in various parameters, the US is slowly coming to terms with the importance that Iran holds as a security-guarantor in the Caspian energy transit.

Furthermore, the other incentives promised by Iran are: discounts for the Indian crude oil purchases and willingness to enter into a production-sharing agreement with India's ONGC Videsh Ltd, for the Farzad-B gas field, its first such contract.[68] Nonetheless, Iran has also agreed to invest a part of the surplus revenues in constructing an LNG terminal in Chahbahar, for shipment of gas exclusively to India. [It is to be remembered that Chahbahar port development is part of India's "strategic cooperation" agreement with Iran, for developing the (Iranian) North-South corridor: India's gateway to the Caspian and Central Asia][69].

China and Iran have had strong trade ties, ever since formal diplomatic relations were established in 1971.[70] Not to mention the fact that China continued to invest heavily in Iranian trade and infrastructure, often unperturbed by the looming threat of sanctions. Although China operates a gas pipeline from Turkmenistan to its northern Xinjiang province, the ever-present conflict-vulnerability in the route, coupled with an unquenchable domestic demand for energy, has pushed China into investing considerably in Iran's oil and gas fields. Moreover, it is already actively participating in the infrastructural development activities to link Iran's northern Caspian ports to the southern Persian Gulf ports, so as to facilitate the quick and efficacious transit of Caspian gas through Iranian territory.[71] To meet the prerequisites for converting the natural gas to LNG (for shipment by tankers), CNPC and other Chinese companies have been awarded tenders by the Iran Liquefied Natural Gas Company (ILC), to jointly build and operate

68. Ibid.
69. Ibid.
70. John S. Park, "Iran and China", see http://iranprimer.usip.org/resource/iran-and-china, accessed on June 22, 2014.
71. "Iran Calls on Chinese to Enter Multi-Billion-Dollar Energy Deals", *Tehran Times*, July 11, 2009, see www.payvand.com/news/09/jul/1106.html, accessed on June 22, 2014.

LNG terminals.[72] With a hopeful reduction in sanctions, there is every possibility that Japanese and South Korean companies will soon also be also vying for stakes in the Iranian oil and gas sector.

Apart from the presumably profound merits that the Iranian transit route enjoys in the technical, economical and environmental spheres, it also presents its geo-political advantages for the West.

The US presently does not import any oil or gas from Iran. Firstly, it has its other sources in the Persian Gulf (like Saudi Arabia, Kuwait, UAE, Iraq, Qatar, etc); secondly, its dependence on Persian Gulf oil and gas is gradually declining in relation to its increasing preference for crude oil from alternative sources like Africa (Angola, Nigeria, etc), Latin America (Venezuela, Ecuador, etc) and Canada; the latter being its own backyard.[73] Nevertheless, the ongoing advancement in 'fracking' technology (fracking is the method used for extracting gas trapped between shale rock formations, by employing high-pressure water jets) and the subsequent shale gas revolution, would mean that the US would attain self-sufficiency, albeit not long-lasting enough, in meeting its demand for natural gas.[74]

Meanwhile, with its eyes set on the increasing relevance of the Caspian oil and gas reserves, the US hopes to churn out a fairly fruitful stake in the Caspian's immense resource wealth. And as mentioned earlier, with the Iranian transit route outweighing the other West-owned pipeline routes (like the BTC) in various parameters, the US is slowly coming to terms with the importance that Iran holds as a security-guarantor in the Caspian energy transit. Moreover, the US government can no longer ignore the long-repeated demand of American multinational oil companies like Chevron

72. Ibid.
73. "US Imports by Country of Origin", *Petroleum & Other Liquids*, June 27, 2014, see http://www.eia.gov/dnav/pet/pet_move_impcus_a2_nus_ep00_im0_mbbl_m.htm, accessed on July 5, 2014.
74. Paul Stevens, "The 'Shale Gas Revolution': Developments and Changes", *Briefing Paper* (The Royal Institute of International Affairs: London, August 2012), see http://www.chathamhouse.org/sites/files/chathamhouse/public/Research/Energy,%20Environment%20and%20Development/bp0812_stevens.pdf, accessed on July 6, 2014.

Corporation and Conoco Phillips to invest in the Iranian oil and gas sector.[75] Resonating with these appeals were the words of Iranian Oil Minister Bijan Zanganeh in a meeting of OPEC oil ministers (last December), the first of its kind since the interim nuclear deal was struck; he expressed his desire for the return of seven major Western multinational oil giants listed herewith: Total of France, Royal Dutch Shell, Italy's ENI, Norway's Statoil, Britain's BP (British Petroleum) and US companies, Exxon Mobil and Conoco Phillips.[76] Apart from the presumably profound merits that the Iranian transit route enjoys in the technical, economical and environmental spheres, it also presents its geo-political advantages for the West: a West-driven strategy, pivoted on an official embracement of the Iranian transit route for the Caspian oil and gas, combined with further active encouragement (mainly through financial assistance), would help weaken Russian suzerainty in the Caspian region.

Contrary to what most naysayers think, an Iran-West rapprochement may not necessarily create an unfillable void in the Iran-Russia bonhomie. One reason for this is that Russia is currently more focussed on exploiting its newly discovered hydrocarbon reserves in the Sakhalin, West Siberian (Priobskoye and Samotlor) and East Siberian (Yamal-Nenets) regions. Moreover, it has already set its eyes on the vast untapped potential of the Arctic (with which Russia shares the longest coastline).[77] Thereby, through such diversification strategies and pragmatic innovations, Russian oil and gas would continue to retain their huge market base. And regardless of a probable equilibrium shift in the energy trade, Russia-Iran defence ties would continue to foster smooth sailing in the rough seas.[78] The same applies to China, which would be largely unperturbed by the possibility

75. Jay Solomon, "Oil, Auto Companies Make Plans to Invest in Iran if Sanctions Ease", *The Wall Street JournalL (Middle East News)*, July 1, 2014, see http://online.wsj.com/articles/oil-auto-companies-make-plans-to-invest-in-iran-if-sanctions-ease-1404257812#, accessed on July 8, 2014.
76. "Iran Names 7 Western Oil Companies It Wants to Return", December 4, 2013, see www.reuters.com/article/2013/12/04/**iran-oil**-idUSL5N0JJ2A420131204, accessed on July 2, 2014.
77. Andrey Korzhubayev, "Siberia's Oil Future", *Archive No. 1*, 2011, see http://www.oilru.com/or/46/968/, accessed on July 15, 2014.
78. George L. Simpson, Jr., "Russian and Chinese Support for Tehran", *The Middle East Quarterly*, vol. 17, no. 2, Spring 2010, pp. 63-72, see http://www.meforum.org/2690/russian-chinese-support-for-iran, accessed on July 12, 2014.

of a thaw in Iran-West relations. Needless to say, this is best showcased in China's rigorous pursuit of its highly ambitious and far-sighted "New (Overland and Maritime) Silk Road Programme".[79]

Summing up, Iran's inevitable participation in the Caspian energy transit, in one way or the other, holds benefits for all the players involved in the energy scramble. However, the incentives for both Iran and the Caspian trio are remarkably more significant. In the case of Iran, it would help stem the huge gap between being a major producer of petroleum; and yet not being able to sufficiently harness it (for domestic consumption). And as for the three Central Asian Republics, they would be able to export their oil and gas to the consumer nations, in the cheapest possible way. Encapsulating the above two equations, it may be surmised that both parties are undoubtedly in receipt of a win-win situation. Needless to say, the governments of the respective nations must incorporate radical reforms in their energy sectors, to ensure the smooth conduct of trade. Without doubt, development of the necessary infrastructure should be given utmost priority. Moreover, there needs to be a greater impetus towards imparting transparency and accountability in the governments' policies in this regard—whether it is in awarding tenders/contracts to foreign players or in managing the flow of funds. Not to forget, an investment-friendly approach with least complacency and corruption will reap maximum dividends. If these steps are seriously taken into consideration, it would not be long before the world realises the true potential of the Caspian region.

79. Shannon Tiezzi, "China's 'New Silk Road' Vision Revealed", May 9, 2014, see http://thediplomat.com/2014/05/chinas-new-silk-road-vision-revealed/, accessed on July 1, 2014.

ARCTIC REGION: THE NEW GEO-POLITICAL THEATRE OF RUSSIA

CHANDRA REKHA

INTRODUCTION

Known as the 'Frozen Desert', the Arctic region occupies a unique position covering one-sixth of the planet's landmass and spans 24 time zones. The region is blessed with enormous amounts of natural resources, including fish, oil, gas and various minerals. The Arctic Ocean is the smallest and shallowest of the world's five major oceanic divisions, with an average depth of nearly a 1,000 m (about 3,450 ft). Vast ledges of sub-sea land extend from the surrounding continents and underlie nearly two-thirds of the ocean.[1] The Arctic littoral states are: Russia, Canada, the United States, Denmark (Greenland), Norway, Finland, Sweden and Iceland.

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1. "Arctic Facts", http://arctic.ru/arctic-facts, accessed on September 30, 2014.

Fig. 1: Arctic Littoral States

Source: http://moneyweek.com/profit-from-the-scramble-for-the-arctic-57932/

In recent years, there have been megatrends in the North Pole as catastrophic global climatic change has led to commercial shipping, oil politics and militarisation in the region. Moreover, due to its strategic location, the Arctic is seen as the future alternative communication route. Consequently, the above factors have catapulted inter-state competition and rivalry for sea expanses between the Arctic littoral states as the region holds the key to supremacy in the global arena of the 21st century. Bearing in mind the geo-politics of the littoral states in the region, it is important to evaluate the Russian geo-strategic discourse in the Arctic territory and to what extent the region will contribute in restoration of Russia's global power status in international politics.

Before one looks into Russia's geo-political ambitions in the Arctic region, it is crucial to elucidate various aspects that have contributed to the resurgence of the Arctic region in the geo-political discourse of the international community. The following section will attempt to provide an overview of the Arctic region.

BRIEF SURVEY OF THE ARCTIC

Impact of Global Warming

Environmental pollution and degradation have emerged as a threat to the Arctic environment. While environmentalists fear the negative impact of global warming in the region, it has, however, benefitted the Arctic littoral states in expanding oil and gas exploration and has also created new commercial routes to these countries.[2] Hence, the melting of the Arctic ice has introduced lucrative opportunities as well as geo-political competition among the Arctic nations.

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Featured Resources and Their Relevance

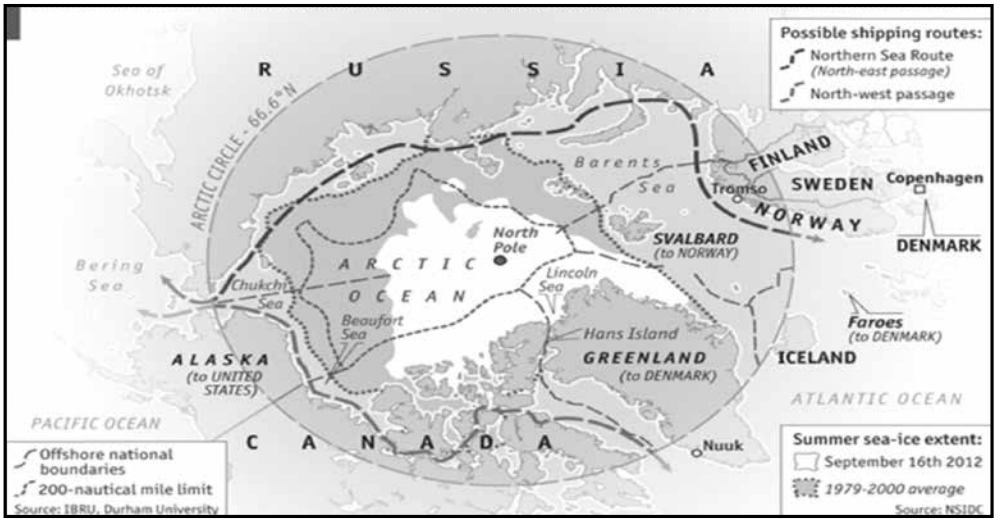
Recent estimates have also shown that nearly 13 percent of the world's undiscovered oil and 30 percent of its undiscovered natural gas can be found in the Arctic, which almost lies in the offshore marine environment. The combination of the melting of the Arctic sea ice and the economic and political attractiveness of non-renewable resources, especially sub-sea hydrocarbons has given rise to Arctic geo-politics and geo-economics. Therefore, there is increased competition among the five coastal states for control over the continental shelf and maritime zones alongside another conflict between the Arctic-5 (Canada, Denmark, Norway, Russia and the US) and the non-coastal states (such as Finland, Sweden, the UK, China, Japan, South Korea, India, etc.) that are also keen to exploit the Arctic's natural resources.[3]

2. Adnan Vatansever and Anna Korppoo, "A Climate Vision for Russia: From Rhetoric to Action", *Policy Outlook*, August 1, 2012. http://carnegieendowment.org/2012/08/01/climate-vision-for-russia-from-rhetoric-to-action/d4tq# accessed on August 10, 2014.
3. "Resource Extraction in the Arctic Domain", Arctic Climate Change and Economy and Society, http://www.access-eu.org/en/economic_sectors/ressource_extraction.html

Arctic Trade Route

The continuous shrinking of the ice caps in the Arctic has piloted opening of trade routes. The littoral states of the Arctic are exploring all possible options to exploit shipping lanes in the region to complement the conventional trade routes during the summer months. The Intergovernmental Panel on Climate Change, in its second report, claimed that the North Pole will become a navigable ocean by the end of the 21st century. The three principal routes are the Trans-Polar Route (TPR), the Northwest Passage (NWP) and the Northern Sea Route (NSR). Each route passes through the Arctic Ocean and links the Atlantic and Pacific Oceans.[4] The Arctic Ocean is also seen by major energy companies as a shipping route for energy supplies.

Fig 2: Arctic Trade Routes



Source:http://www.thegeotradeblog.com/2013/05/new-trade-routes-through-artic-between.html

As the Arctic has now emerged as a particularly active place for claims submission considering the recent discoveries of natural gas and oil in the

4. Ian Storey, "Will Arctic Shipping Routes Eat Singapore's Lunch? Not Anytime Soon, and Maybe Never", *Institute of Southeast Asian Studies*, no. 27, April 28, 2014, http://www.iseas.edu.sg/documents/publication/ISEAS_Perspective_2014_27-Arctic_Shipping_Routes_rev2.pdf, accessed on September 17, 2014.

region,[5] let us also focus on the international governing institutions as many of the littoral states of the Arctic are engaged in multiple territorial disputes.

INTERNATIONAL GOVERNING INSTITUTIONS OF THE ARCTIC

The legal status quo in regard to the territorial claims and geo-political exploration of the Arctic has sovereignty issues looming as the predicted prosperity of the Arctic has propelled countries to compete over territory and the natural resources lying beneath the water. Hence, the international law has provided transparency and answers to some extent regarding the same. The following section will evaluate the role of governing institutions in facilitating cooperation and resolving boundary claims by the littoral states of the Arctic region.

United Nations Convention on the Law of the Sea (UNCLOS)

The United Nations Convention on the Law of the Sea establishes a comprehensive legal framework to regulate all ocean space, its uses and resources. It contains provisions relating to the territorial sea, the contiguous zone, the continental shelf, the Exclusive Economic Zone (EEZ) and the high seas. One of the most important parts of the convention concerns the exploration for, and exploitation of, the resources of the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction (the area). The convention declares the area and its resources to be "the common heritage of mankind".[6]

Commission on the Limits of the Continental Shelf (CLCS)

Under the UNCLOS, the continental shelf is that part of the seabed over which a coastal state exercises sovereign rights with regard to the exploration and exploitation of natural resources, including oil and gas deposits as well as other minerals and biological resources of the seabed. Based on this factor, the legal continental shelf extends to a distance of 200 nautical miles

5. "Arctic Region Facts", http://arcticfocus.com/arcticregionfacts/ accessed on September 24, 2014.
6. International Tribunal for the Law of the Sea, http://www.itlos.org/index.php?id=15 accessed on July 12, 2014.

(nm) from its coast, or further if the shelf naturally extends beyond that limit.[7] The Commission on the Limits of the Continental Shelf (CLCS) is a body created by the 1982 Law of the Sea Convention.[8]

International Tribunal for the Law of the Sea

The International Tribunal for the Law of the Sea is an independent judicial body established by the UNCLOS to adjudicate disputes arising out of the interpretation and application of the convention. The tribunal is composed of 21 independent members, elected from among persons enjoying the highest reputation for fairness and integrity and of recognised competence in the field of the law of the sea. The tribunal has jurisdiction over any dispute concerning the interpretation or application of the convention, and over all matters specifically provided for in any other agreement which confers jurisdiction on the tribunal (Statute, Article 21). The tribunal is open to state parties to the convention (i.e. states and international organisations which are parties to the convention). It is also open to entities other than states parties, i.e., states or inter-governmental organisations which are not parties to the convention, and to state enterprises and private entities in any case expressly provided for in Part XI or in any case submitted pursuant to any other agreement conferring jurisdiction on the tribunal which is accepted by all the parties to that case (Statute, Article 20).[9]

The Arctic Council

The Arctic Council, created in 1996, is an inter-governmental forum that aims to promote cooperation and interaction among the Arctic states with regard to issues concerning the Arctic Circle. The permanent members are: the Russian Federation, Norway, Canada, Sweden, Finland, Iceland, Denmark (with representation of Faroe Islands and Greenland) and the

7. "What is the Extended Continental Shelf?", http://www.geolimits.com/services/extended-continental shelf/continental-shelf/ accessed on July 12, 2014..
8. Ted L. McDorman, "The Role of the Commission on the Limits of the Continental Shelf: A Technical Body in a Political World", *The International Journal of Marine and Coastal Law*, vol. 17, no. 3, 2002, p. 301.
9. International Tribunal for the Law of the Sea, http://www.itlos.org/index.php?id=15, accessed on July 12, 2014.

USA. However, the council also hosts non-permanent members that include countries like Poland, France, Germany, Spain, the UK and the Netherlands, multiple international organisations and Non-Governmental Organisations (NGOs). The Arctic Council concentrates on preservation of the environment and on relevant research of the Arctic zone.[10]

GEO-POLITICAL ASPIRATIONS OF RUSSIA IN THE ARCTIC

The peripheral status of the Arctic was exemplified during the Cold War with geo-political dynamism. The East-West stand-off was centred on the people and economic and political systems of continental Europe; as a result, the rival sides devoted their resources and first order of response to the Arctic. Unlike other parts of the world, which served as proxies in the Cold War struggle, the Arctic played an auxiliary role as a region that afforded the shortest route through which increasingly advanced defence technologies, such as long-range bombers, submarines and missiles might be trained on an adversary. In other words, the Arctic was not viewed as a prize in itself during the Cold War, but was instead valued for its strategic utility.[11]

With the development of modern technology and the Industrial Revolution, the North Pole became a transit area for many nations, including Soviet Russia, for transcontinental communication between countries. The period also escalated the projection of military might in the region between the two superpowers. Soviet Russia viewed the Arctic geo-politics as an opportunity to project primacy of naval supremacy against adversaries like the US to gain command over the Arctic. The end of the Cold War, however, had a mixed impact on the Arctic's ranking among the geo-political issues of the circumpolar states. With the implosion of the Soviet Union and the eventual end of bloc politics, Russia, the successor state of the Soviet Union, struggled with a staggering economy and crippling technology. This, in a way, diluted Russia's focus in the region.

10. Criekemans and Mols, "Towards Security in the Arctic Region?", Model United Nations - Flanders, OXIMUN 2011, p. 5.
11. Natalie Mychajlyszyn, "The Arctic: Geopolitical Issues", *International Affairs, Trade and Finance Division*, October 24, 2008, pp. 2-4.

The scope for new economic prospects in the energy, mineral and maritime transport sectors has offered significant opportunities for the traditional Arctic states, some of which are already active players in the region.

However, since 2000, Russia has made a major comeback in international politics post-Soviet disintegration. With new found confidence and the revamping of its economy and military modernisation, Russia has been clear about its intentions to exploit and access the Arctic to project its influence in the region. In addition, it should also be noted that, in contrast with the Cold War era, the aim of the current military efforts being made by Russia in the Arctic region is the protection of its economic interests and establishment of its sovereignty claim over the maritime zones and trade routes.

Hence, this paper attempts to look at how the Arctic in the 21st century has become the new political theatre for Russia.

Russian Geo-political Discourse of the Arctic in New World Order

In recent times, the impact of climatic change has led to a resurgence of the Arctic as a new geo-political theatre for power projection of the major international players, including Russia. The scope for new economic prospects in the energy, mineral and maritime transport sectors has offered significant opportunities for the traditional Arctic states, some of which are already active players in the region. The Arctic's profile in the foreign policies of the countries concerned has been raised over the last 20 years. Moreover, melting sea ice has facilitated the efforts of states such as Russia, Canada and Denmark to carry out mapping exercises to delineate their respective continental shelves according to the 1982 UNCLOS and to stake their legal claims to potentially lucrative rights and, hence, has resulted in perceived increase in suspicion and distrust among the countries. Russia in this regard is labouring hard to justify its claims on this part in the UN Commission on the Continental Shelf. For instance, expeditions have been organised to get scientific evidence of its claim over the Lomonosov ridge which will be dealt with later in the paper. Moscow plans to prepare a new

application for the extension of its exclusive economic zone by 2015.[12]

As for access to commercial trade routes, the Northern Sea Route was first opened in 2005 for international shipping; however, in order to complete the passage, ships must be escorted by icebreakers.[13] Ships from other countries have now begun to use the route, and the Russians also want to develop an international trade route. However, the level of activity is still lower than it used to be. New prospects in the region have also attracted new players that are keen to tap into the economic potential and to access, exploit and govern the frozen dessert. The net effect of these and other developments is that the Arctic today is a global Arctic: it can no longer be perceived as a spatially or administratively confined region, but is instead taking on a new form and dynamics in the midst of contemporary global politics.[14]

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Moreover, with growing geo-political competition in the region, tensions over the region escalated when a Russian expedition called Arktika 2007 descended to the seabed to collect evidence and planted a Russian flag, transforming the issue from a scientific one to a political matter. The North Pole is a strategic location for the Arctic countries. Canada has already announced plans to build two military bases relatively close to the North Pole; an action which has caused a great amount of resentment in the Russian Federation.

12. Heininen, Sergunin, Yarovoy, "Climate Change in the Arctic: Geopolitical and Security Implications", September 24, 2013. http://valdaiclub.com/economy/63020.html, accessed on September 12, 2014.
13. Ian Storey, "Will Arctic Shipping Routes Eat Singapore's Lunch? Not Anytime Soon, and Maybe Never", Institute of Southeast Asian Studies, no. 27, April 28, 2014 http://www.iseas.edu.sg/documents/publication/ISEAS_Perspective_2014_27-Arctic_Shipping_Routes_rev2.pdf, accessed on September 17, 2014
14. Kola Bay, "The Global Arctic: The Growing Arctic Interests of Russia, China, the United States and the European Union", *Finnish Institute of International Affairs*, August 2013. p. 3.

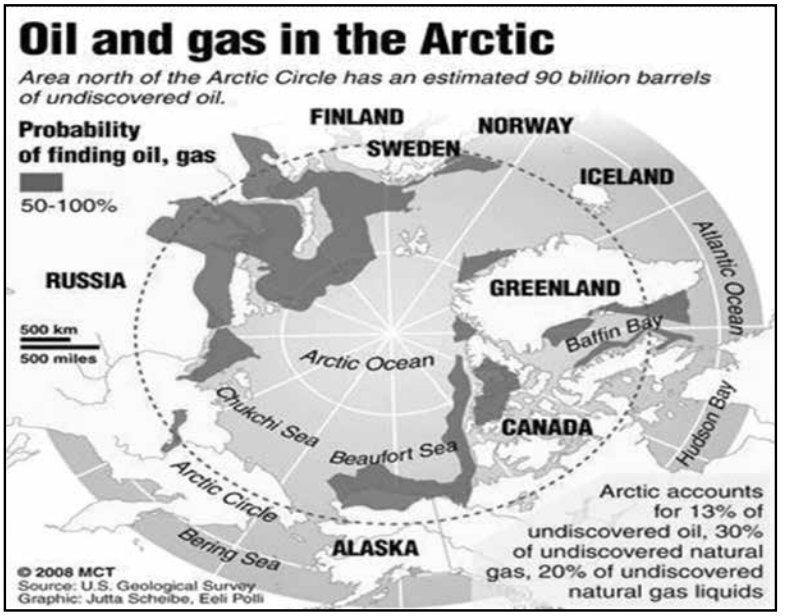
THE ENERGY ASPECT

According to the United States Geological Survey, approximately 13 per cent of the world's undiscovered oil deposits and 30 per cent of its natural gas reserves are above the Arctic Circle. Anxious nations surrounding the Arctic have encouraged energy companies to drill in the region to tap into this resource.[15] Nearly 20 percent of undiscovered global hydrocarbon reserves are located in the Arctic area, most of them in the Russian Arctic.

It is a well-known fact that Russia's economy is heavily dependent on exports of oil and gas, and the government relies on its huge energy markets for much of its economic development.[16] It is stated that roughly 20-25 percent of the Russian Gross Domestic Product (GDP) is derived from the oil and gas markets. Hence, energy resources are vital to the Russian national security and economy as the revenues derived from these markets are, in turn, diverted to Russian defence industries and military modernisation, so much Russia's domestic social programmes and infrastructure investments are critically dependent on revenues from the natural resource exports.

15. Michael T. Klare, "Rushing for the Arctic's Riches", *The New York Times*, Sunday Review, December 7, 2013, http://www.nytimes.com/2013/12/08/opinion/sunday/rushing-for-the-arctics-riches.html?pagewanted=2
16. Ibid.

Fig 3: Energy Reserves in the Arctic Region



Source: http://sputniknews.com/business/20120418/172890279.html

This economic factor of the Arctic plays an increasing role in this equation as a strategically vital resource base for Russia. So far, the Russian Arctic has been responsible for about 10-15 percent of the Russian GDP and 25 percent of its foreign exports and systematic efforts are on to increase these figures. Russia's increasing focus towards the North Pole is also due to the fact that Russia's mature hydrocarbon sources in Western Siberia are slowly drying up. Recent hydrocarbon activities in the Russian Arctic have taken place primarily through onshore projects in key locations such as the Yamal peninsula and in nascent offshore projects on the Arctic sea-bed in the Barents, Pechora and Kara Seas. These offshore projects have often taken the form of joint ventures between Russian and international energy corporations. This signals Russia's need to seek investments and technological knowhow through international cooperation.[17]

17. Bay, n. 14, p. 3.

With Russia already having explored drilling options in the Arctic, its energy giant Gazprom has installed its Prirazlomnaya platform in the Pechora Sea, above northwestern Siberia. Further east, in the Kara Sea, the state-owned Rosneft is collaborating with ExxonMobil to develop promising deposits; Rosneft has also teamed up with Statoil of Norway and Eni of Italy to investigate prospects in the Barents Sea.[18]

Similarly, hydrocarbons provide important leverage for the Russian foreign policy posture. This was evident in the recent Ukraine imbroglio and imposition of sanctions by the international community on Moscow for its role in the Kiev uprising. Russia is Europe's main energy supplier, providing about 30 percent of Europe's natural gas and 35 percent of its oil imports. Given the substantial trade and economic cooperation between Russia and the members of the EU, any form of sanctions with regard to the energy markets of Russia will have repercussions on both regions and on market security.[19] According to European estimates, Europe's losses due to the sanctions amounted to about Euros 40 billion. The measures mostly affected the countries that had close ties with Russia: Germany, the Netherlands, Lithuania, Poland and Estonia.[20] It can be summarised that Russia's military posture and foreign policy assertiveness in the Ukraine crisis is due to the enormous dependence of the European countries on the Russian energy markets. This has also reasserted Russia's emerging global status.

Moreover, although the advent of shale gas is seen as an alternative to the Russian energy markets, its production cost is high. In order to continue its muscle flexing through the supply of energy resources to meet the growing energy demand, the energy reservoirs in the Arctic will act as an alternative to the depleting oil and gas resources in regions like Western Serbia. The Arctic which was a geo-political backwater for a long time, until the global warming scenario and its impact on the frozen dessert, has now become a bone of contention despite the advent of shale gas and existence

18. Klare, n. 15.
19. Arvind Gupta, "Crimean Crisis: A New Phase of Cold War?", Institute for Defence and Strategic Analysis, March 21, 2014, p. 3 http://idsa.in/idsacomments/CrimeancrisisANewPhaseofColdWar_agupta_210314, accessed on May 10, 2014.
20. "Russia Prepares New Sanctions Against the West", September 16, 2014, http://english.pravda.ru/russia/economics/16-09-2014/128543-russia_new_sanctions-0/

of oil and gas reserves around the world. This has caused a paradigm shift in the geo-political relevance of the Arctic as it has now gained a unique geo-political discourse among nations and private players in the region.

Although global warming is likely to reduce the extent of sea ice in the summer and fall, sea ice covers much of the area in winter, and storms pose a constant danger. Adding another layer of risk, many of the boundary lines in the Arctic are yet to be fully demarcated, and various Arctic powers have threatened to use military force in the event that one or another intrudes on what they view as their sovereign territory. [21]

RUSSIAN MILITARISATION OF THE ARCTIC

Another important feature of the Arctic region is its military significance. The opening up of the northern sea lanes and the quest to formally claim parts of its seabed as national territory has also increased the possibility of militarisation of the Arctic. Current military activities such as airborne reconnaissance and submarine patrols as well as military escorts of icebreaker-led seabed mapping exercises are not always transparent to neighbouring nations and may well send the signal that the Arctic is no longer an area destined to remain peaceful and cooperative. And with so much potential wealth at stake, the possibility of unintended but still rapid escalation of military activity cannot be ruled out.[22]

During the Cold War period, militarisation in the Arctic accelerated with the development of Intercontinental Ballistic Missiles (ICBMs) and production of nuclear-powered attack submarines, with both the Soviet Union and United States cascading resources into building up their capabilities in the Arctic area. Moreover, the production of nuclear submarines became the foremost factor for regional dominance in the Arctic region. Till 1986, the Russian Northern Fleet comprised nearly 180 nuclear submarines while the United States had 140 nuclear submarines. Approximately 265 nuclear tests were conducted by the USSR in the Novaya Zemlya archipelago in North Serbia. A few underground nuclear detonations took place on an

21. Klare, n. 15.
22. Daniel P. Fata, "Arctic Security: The New Great Game?", *Halifax International Security Forum*, November 2009. www.gmfus.org, accessed on September 17, 2014.

island near the Alaskan coast and the US-USSR maritime border. Mikhail Gorbachev called for the "Murmansk Initiative" for cooperation in scientific development and environmental issues, but to no avail. Between 1955- 2004, the Russian Navy built nearly 249 nuclear submarines.[23]

Post Soviet disintegration, Russia the successor state of the Soviet Union, struggled with an economic crisis, and its defence industry lost most of its client nations due to this crisis, clouded with endemic corruption and crippling of technology of the industry. This also impacted its military growth in the Arctic region. Many of the Russian Northern Fleet submarines were decommissioned. The Distance Early Warning (DEW) System line sites were handed back to Canada and the United States in 1990. From 1990-2000, cooperation initiatives related to the Arctic mushroomed in international relations and the most prominent one was the establishment of the Arctic Council.[24]

In 2013, when Russia announced its decision to reopen the northern naval base in the Arctic, it reignited the debate on militarisation of the Arctic region. As the northern ice-cap melts and critical sea-routes become navigable, it is undeniable that the Arctic nations will not be able to resist the impulse of militarising the region. The aim of exploitation of the region's undiscovered natural resources has, in turn, resulted in increasingly assertive territorial postures being adopted by regional stakeholders, and the gradual dominance of a security-driven discourse.[25] In the same year, Moscow held a massive military exercise in the Russian Far East region, reportedly the biggest "snap-drill" since the era of the Soviet Union. The exercise involved more than 1,60,000 servicemen, 1,000 tanks, 130 planes and 70 ships, and came only a month after Russia submitted a claim to the UN to extend its 200-mile Exclusive Economic Sone (EEZ) by another 150 miles or 1.2 million sq km. But Moscow's claim is being contested by other Arctic nations too.[26]

23. Spohr, Horing, Cerioti, Lersch and Soares, *UFRGS Model United Nations Journal*, 2013, p. 17, http://www.ufrgs.br/ufrgsmun/2013/wp-content/uploads/2013/10/The-Militarization-of-the-Arctic-Political-Economic-and-Climate-Changes.pdf, accessed on October 9, 2014.
24. Ibid., p. 17.
25. Abhijit Singh, "The Creeping Militarization of the Arctic", October 16, 2014. http://thediplomat.com/2013/10/the-creeping-militarization-of-the-arctic/ pp. 1-3.
26. Ibid., p. 1.

There is a growing movement to establish the Arctic Circle as a nuclear weapon-free zone. Though both the US and Russia have reduced their operations in the Arctic, they have not eliminated them completely. The Kola peninsula remains the headquarters of Russia's nuclear forces with submarines, aircraft, nuclear-capable missiles and nuclear-capable submarines, plus research and development facilities for the modernisation of its Northern Fleet. Alaska provides a home to US nuclear weapons bases and the ground-based radar sites for its missile defence system.[27] However, the Arctic nations share increased patrolling and expeditions in the region and mutual espionage. Russia views the Arctic as crucial for its protection and is ready to defend its interests.

Canada, the Kingdom of Denmark (via Greenland), and the Russian Federation each has asserted that the ridge is an extension of its own continental shelf.

RUSSIA'S TERRITORIAL DISPUTES IN THE ARCTIC

Some of the unresolved legal issues in the Arctic are of particular relevance as they will help to determine the future relationship between Russia and its northern neighbours. Unresolved territorial disputes have also become a major impediment in determining Russia's influence in the region. Given below are a few of the territorial disputes that Russia has been involved in.

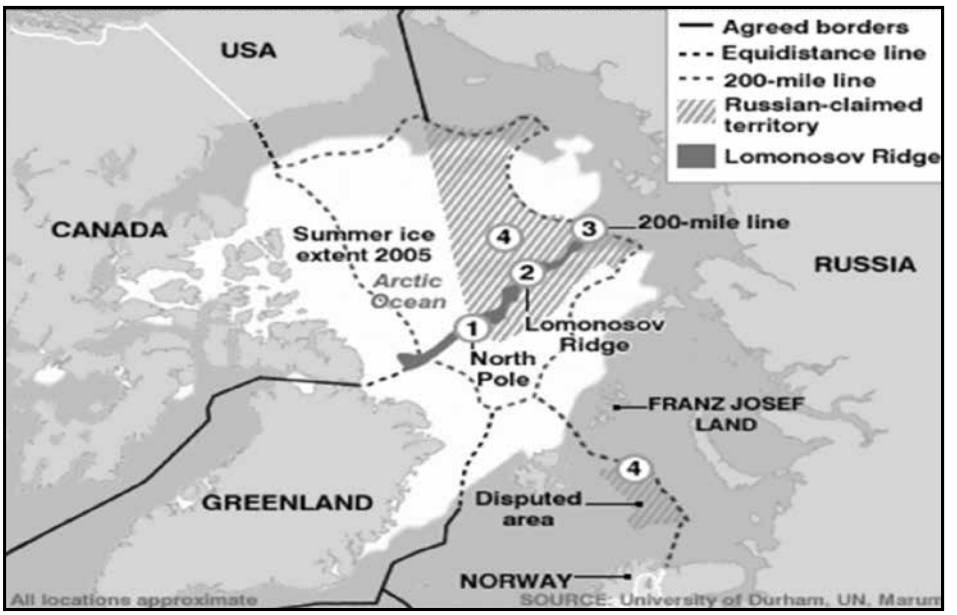
Lomonosov Ridge

In response to Canada's claim that its boundaries extend into the Arctic and up to the North Pole, in 1925, Russia, the then USSR, declared that all lands and islands, between the USSR and North Pole, were the territory of the USSR. Following the establishment of UNCLOS in 1982, the commission allowed for a nation to extend sovereignty beyond the limits of the EEZ if the CLCS verifies that a country's continental shelf extends further. In accordance with UNCLOS provisions, the Russian Federation became

27. "Arctic Security", http://www.thesimonsfoundation.ca/arctic-security, accessed on August 28, 2014.

the first Arctic state to submit its claim to 1.2 million sq km of territory, including the North Pole, to the CLCS in 1991.[28]

Fig 4: Lomonosov Ridge



Source: http://truthmovement.com/?p=62

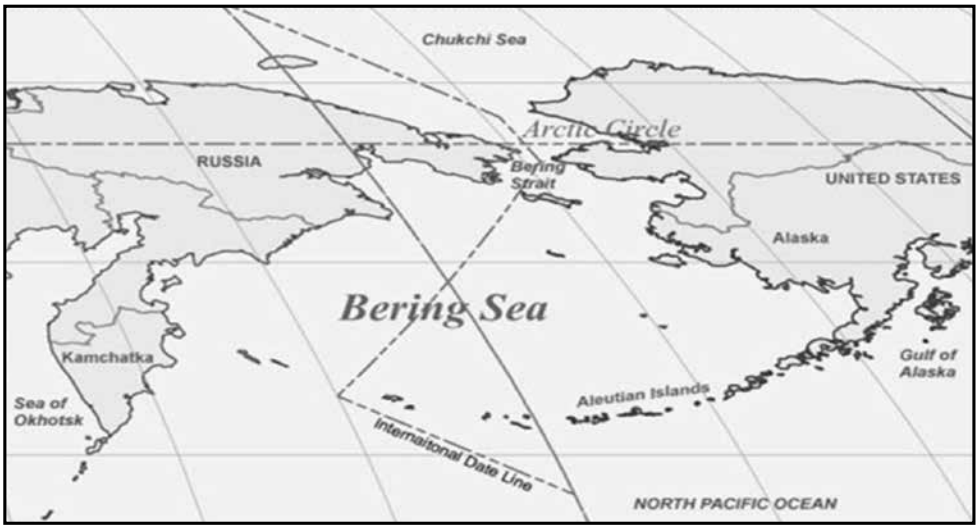
In 2001, Russia again submitted a claim to the CLCS that the Lomonosov ridge was an extension of its continental shelf. Russia stood to potentially acquire nearly one-half of the Arctic Ocean, including the North Pole. In 2002, the UN commission neither rejected nor accepted the proposal, recommending that additional research was necessary. On August 2007, Russia symbolically claimed the North Pole by planting a titanium deep-sea flag on the seabed (14,000 ft) below the North Pole during the Arktika sea expedition. Samples were submitted as evidence to the CLCS that the Lomonosov ridge is an extension of the Eurasian continental shelf. This would give the Russian

28. "Evolution of Arctic Territorial Claims and Agreements: A Timeline (1903-Present)", September 15, 2013, http://www.stimson.org/infographics/evolution-of-arctic-territorial-claims-and-agreements-a-timeline-1903-present/ September 15, 2014.

Federation sole access to nearly one-half of the Arctic and the region of the North Pole. Canada, on the other hand, is also expected to claim that the ridge is an underwater extension of Ellesmere Island. Canada, the Kingdom of Denmark (via Greenland), and the Russian Federation each has asserted that the ridge is an extension of its own continental shelf. If proved that the Lomonosov ridge is an extension of the respective country's continental shelf, that Arctic state would obtain unfettered access beyond its EEZ of 200nm, and would, in turn, gain access to the seabed and its resources across the continental shelf. The United States claims it to be an oceanic ridge and, thus, not an extension of any state's continental shelf, and, therefore, refutes any claim to Russia's ownership.[29]

Bering Sea: US-Russia Dispute

Fig 5: Bering Sea Dispute



Source: http://arc:ticfocus.com/arcticregionfacts/

In 1867, the United States purchased Alaska from the Russian government but mutually accepted marine claims were limited to a narrow band of

29. Ibid.

Oil and gas deposits have been discovered in both the offshore and onshore territories near the Bering Sea. But the main 'apple of discord' is not the Bering Sea itself but the adjacent Chukchi and East Siberian Seas (parts of the Arctic Ocean) where the US and Russian maritime and continental shelves' boundaries are not settled.

coastal zone. The 1867 Treaty defined a boundary between the two nations through the Bering Sea. As the Law of the Sea principles began to govern the world's oceans, the 1867 Treaty gradually became the most contentious marine boundary issue. Aggravating the issue further, neither of the countries has produced the original or other authenticated maps used during the negotiations to resolve the issue. In 1977, the United States and the Soviet Union implemented a 200 nm EEZ, and exchanged diplomatic notes depicting their interest to respect the line set forth to delineate the marine boundaries based on the 1867 Convention. Ironically, differences in each country's interpretation of the 1867 Treaty became apparent, placing an area of nearly 15,000 sq nm in dispute. Following nearly a decade of negotiations, a new agreement was reached between the two countries in 1990 which apparently ceded territory of both countries from their previous claims; the US still controlled a far greater amount of area in the Bering Sea.[30] It should be noted that before the USSR could make any efforts to ratify its claim, it disintegrated and, hence, the claim came to a vague end.

The three major causes for the continuation of the Bering Sea dispute between the two countries are:

- The Bering Sea constitutes a strategically important area for both the US and Russian fishing industries. It supplies a third of Russia's and a half of the United States' total annual catch. Hence, for both the Alaskan and Russian Far East's regional economies, fishery is important in terms of revenues, employment and sustainable development.
- Another important aspect to the ongoing dispute between the two

30. Vlad M. Kaczynski, "US-Russian Bering Sea Marine Border Dispute: Conflict over Strategic Assets, Fisheries and Energy Resources", *Russian Analytical Digest*, 20/07, pp. 2-3.

countries is the 'hydrocarbon factor'. Oil and gas deposits have been discovered in both the offshore and onshore territories near the Bering Sea. But the main 'apple of discord' is not the Bering Sea itself but the adjacent Chukchi and East Siberian Seas (parts of the Arctic Ocean) where the US and Russian maritime and continental shelves' boundaries are not settled.

In 1926, Moscow established the borders of maritime territories in the region, using the principle of sector division. End points were located in the North Pole and the extreme point of the land boundary, between which a straight line was drawn to separate the waters.

- Moreover, the Bering Sea is an important transport junction between the Russian Far East and East Asia and Alaska. Additionally, with growing importance of the Northern Sea Route (NSR) (controlled by Russia) and Northwest Passage (controlled by Canada) the Bering Sea, especially the Bering Strait, constitutes an important transit area for the future traffic from East Asia to Europe and North America (and back).[31]

Russia, Norway and the Barents Sea Dispute

The Barents Sea is a part of the Arctic Ocean. Named after the Dutch explorer Willem Barents, it is bounded by the Norwegian and northwestern Russian mainland (south), the Norwegian Sea and Svalbard (west), Franz Josef Land (north), and the Kara Sea and Novaya Zemlya (east). It is 1,300 km long and 1,050 km wide and covers 1,405,000 sq km. Its average depth is 229 m, with a maximum depth of 600 m in the major Bear Island Trench.[32] According to an agreement signed in 1872, the rights to the Svalbard archipelago were solidified simultaneously for Russia, Sweden and Norway. The issue of the Barents Sea began in February 1920: eight countries (the US, Denmark,

31. Valery Konyshev and Alexander Sergunin, "Russia's Policies on the Territorial Disputes in the Arctic", *Journal of International Relations and Foreign Policy*, vol. 2, no. 1, March 2014, pp. 56-58.
32. Ibid., p. 66.

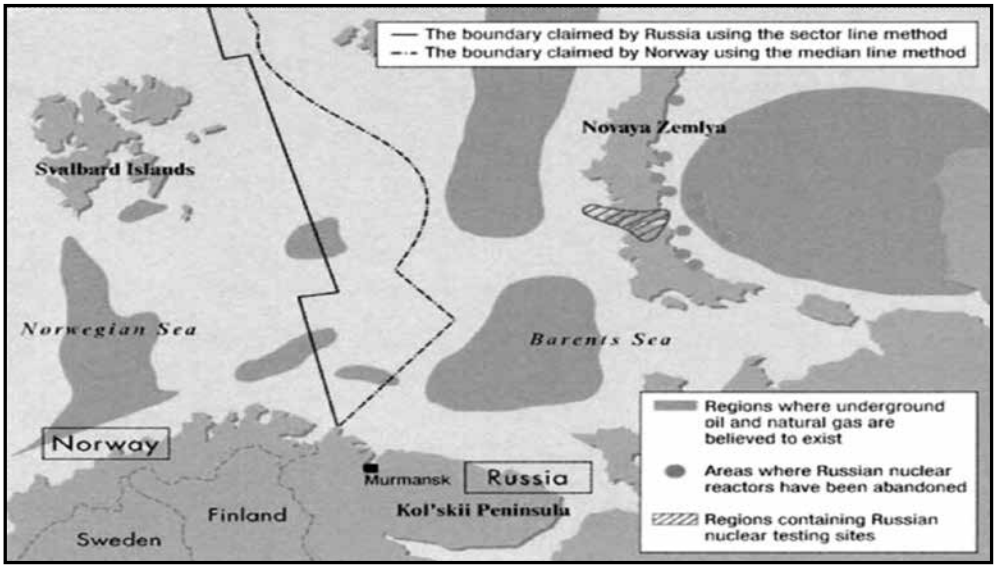
Russia needs to overcome its apprehensions about the other Arctic littoral states and work towards addressing the threats arising from environmental degradation of the Arctic.

France, Italy, Japan, Netherlands, the UK and Sweden) without the consent of Russia, gave Norway sovereignty over Svalbard during a civil war in Russia. Norway was only entitled to own and develop the land. The sea around Svalbard and the continental shelf remained a free zone. The agreement did not allow Norway to consider the waters around the archipelago as its territorial waters; however, Oslo tried its best to demonstrate that it owns this territory. Norway, thus, practically annuls the agreement from 1920.[33]

The Soviet Union, on the hand, joined the agreement from 1920 with a right to continue economic activity on the island. It is noteworthy that the USSR considered the 1920 document to be discriminatory. In 1926, Moscow established the borders of maritime territories in the region, using the principle of sector division. End points were located in the North Pole and the extreme point of the land boundary, between which a straight line was drawn to separate the waters. The Norwegians, on the other hand, used the demarcation of the median line between the insular territories of the two countries. The result was a controversial area of about 155,000 sq km. It was a piece that exceeded all Norwegian maritime territories in the North Sea. Dissatisfied with the 1920 agreement, Norway gave up sovereignty over Svalbard, as it was the only agreement on which Oslo could count on for full jurisdiction over the island. Thus, the situation rolls back to the agreement of 1872, when the status of Svalbard was determined by only two states: Russia and Sweden-Norway.[34]

33. "Barents Sea of Discord for Russia and Norway", March 7, 2013. http://english.pravda.ru/business/companies/07-03-2013/124001-russia_norway-0/ accessed on August 14, 2014.
34. Ibid. http://english.pravda.ru/business/companies/07-03-2013/124001-russia_norway-0/

Fig 6: Barents Sea Dispute



Source: https://nippon.zaidan.info/seikabutsu/2003/00160/contents/0003.htm

While the dispute continued over sharing the shelf, in 2010, Russia and Norway ended the 40 years tiff by signing a treaty that allowed access for exploration of new oil and gas resources in the Arctic region. Delimitation of the Barents Sea dispute is viewed by many experts as a model to settle the Arctic disputes between the concerned nations.

Fig 7: The New Russia-Norway Barents Sea Border

Source: http://02varvara.wordpress.com/2010/09/29/ria-novosti-infographics-russia-and-norway-divide-disputed-barents-sea-territory/01-russia-and-norway-divide-disputed-barents-sea-territory-ria-novosti-infographics/

FUTURE PROSPECTS AND CHALLENGES FOR RUSSIA IN THE ARCTIC

In view of the relevance of the Arctic region as the new political theatre for Russia's resurgence, it is important for Russia to address several issues related to the region in order to establish peaceful coexistence and regional stability.

Address the Impact of Climatic Change

The catastrophic climate change has had a severe impact on the Arctic ecosystem although it is not due to the act of an individual country but due to the negligence of all active nations in the Arctic zone. Russia needs to overcome its apprehensions about the other Arctic littoral states and work towards addressing the threats arising from environmental degradation of the Arctic.

Regulate its Military Activities

Though resource rivalry and threat perceptions in the Arctic are inevitable, Russia should take a leap of faith by taking up initiatives that do not endanger the stability of the region. This can be done through coordination with militarily active Arctic nations and by curbing nuclear activities and

militarisation in the region and also by monitoring sustainable use of the Arctic resources.

Settlement of Disputes

There are unresolved disputed areas and issues involving Russia. With the successful resolution of the Barents Sea dispute, Russia can resolve the longstanding Lomonosov ridge and Bering Sea disputes on similar lines, in order to make the Arctic region a zone of peace, stability and cooperation. Countries like the US and Canada should also shun the residual Cold War geo-political storylines involving Russia. Like the rest of the Arctic countries which promote their national interests in the region, Russia is no exception. It is important for these countries to realise that the Arctic is the next geo-political reality; therefore, all the Arctic nations should work in conjunction and not isolate Russia, to establish not a zone of conflict but rather a zone of stability and peace in the region.

Enhance the Role of International Governing Institutions

The scope of the international governing institutions should be further enhanced and expanded in order to provide unlimited participation by the members involved. Peaceful coexistence can be achieved not by creating 'balance of power' in the region but by 'accommodating' all active members of the Arctic, including Russia. Hence, the international convention should specifically provide instructive and politically feasible conduct of activities in the Arctic that address the wider issues involved in the region. This would, in turn, result in governance of the Arctic region in which there is equal participation among the Arctic nations and private players, NGOs and non-member states of the Arctic like India and China.

Align with Traditional Partners

The Ukraine crisis and the imposition of sanctions on Russia has not only had a major impact on Russia's fragile economy but also decreased Moscow's influence in the international community. As a response, Russia has now shifted its focus from the European region to the 'Asia Pivot'. Russia has strong

partnerships with India and China, and, hence, should take both countries into confidence in order to enhance its geo-political discourse in the North Pole. Moreover, the exploration of the Arctic's rich natural resources by Russia, will, in turn, lead to geographical expansion of its energy markets in the future, with India and China being the two largest client nations. Recently, Russia and China launched the construction of the world's largest pipeline, the 'Sila Sibiri (Power of Siberia)' pipeline.

Besides, Moscow is desperately in need of foreign investment and technology to develop its shipping and oil and gas industries, as well as overcome environmental risks in the Arctic. Without large-scale investment and expertise, these initiatives are likely to be poorly implemented. At the same time, security concerns are pushing Russia to bolster its military modernisation in the Arctic by reestablishing bases and reequipping its forces and protecting its sovereignty in the region.[35] China, as Russia's strong ally, can play a major role in enhancing Moscow's capability in the North Pole.

The recent turn of events and changing geo-political situation may have deterred Russia's progress in attaining global power status but the Arctic region will be a key region in the resurgence of Russia in the international community. The geo-strategic location, commercial routes and the rich oil and gas deposits have led to a 'New Grand Game' in the Arctic Circle which has just begun. The international power politics in the region will determine Russia's future in security interests and energy trade. It is, however, important to see if the Arctic Ocean will indeed bring back Russia's lost glory, or lead to a 'clash of titans'; or will the Arctic emerge as a region for 'cooperation' between the conflicting countries in the region? Russia should behave responsibly and avoid getting involved in any form of military adventurism in the region. It should rather take the initiative to resolve the territorial disputes on amicable terms and find ways through which it can cooperate with other major players in exploiting the future prospects of the Arctic Circle.

35. Nadezhda Filimonova and Svetlana Krivokhizh, "A Russian Perspective on China's Arctic Role", *The Diplomat*, September 27, 2014, http://thediplomat.com/2014/09/a-russian-perspective-on-chinas-arctic-role/ accessed on November 14, 2014.

RUSSIA IN THE ARCTIC: CHALLENGES AND PROSPECTS FOR TAPPING ENERGY RESOURCES

TRIVUN SHARMA

INTRODUCTION

The growing demand for energy resources will have a potential impact on the availability of exhaustible resources in the future. This scarcity of resources is bound to impact the consumption and price of such resources. It is in this context that the Arctic region has become a contested zone between the major powers, especially for Russia. Global warming has made the ecology of this region fragile. Efforts have been made to explore the hydrocarbons which were once considered inaccessible. The accelerating pace of ice melting will make exploration in the Arctic profitable and viable. Oil and natural gas, however, do not comprise the only factor that concerns the Arctic. The region is also contested over sovereignty and legitimate rights. This paper would focus on certain key issues pertaining to the undiscovered natural resources, the presence of international powers, and how Russia can address its Arctic goals and challenges.

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GEO-POLITICS OF THE ARCTIC REGION

The Arctic Ecology

The Arctic region is fundamentally very different from other regions like the Middle East, Western Europe or Southeast Asia. It can be described as the region of peripheries.[1] The total area included within the boundaries is around 40 million sq km or 8 percent of the earth's total surface.[2] However, given the vast geographical area, the human population in the region is quite dense. The region is inhabited by nearly four million people. More than 40 different languages are spoken by the inhabitants, including the indigenous communities, representing the cultural and social diversity of the region.[3] Furthermore, the region comprises more or less remote portions of countries like Canada, Denmark, Finland, Norway, Sweden, Iceland, United States and the Russian Federation.

The prominence of the Arctic is associated with climate change. Environmentalists have often spoken about the effects of climate change due to global warming. Certainly, the Arctic is a grave reminder of the accelerating pace at which the planet is getting warmer. [4] However, the effects of climate change can be viewed as paradoxical. On the one hand, where global warming is dangerously affecting the Arctic environment, it has also resulted in unfreezing the natural resources that lie beneath the ice cover. The melting of the ice has opened the Northern Sea Passage which is seen as an essential route for maritime commerce, easy access for exploring the vast oil and gas reserves and exploiting the huge fish stock.[5] This provides countries with an opportunity to build infrastructure and explore the rich hydrocarbon deposits. But, at the same time, it also raises

1. Oran R. Young, "Governing the Arctic: From Cold War Theater to Mosaic of Cooperation", *Global Governance* (Lynne Rienner: Colorado, 2005), vol. 11, no.1, pp. 9-10.
2. Ibid.
3. Arthur Brekman, *Environmental Security in the Arctic Ocean: Promoting Cooperation and Preventing Conflict* (Routledge: United Kingdom, 2010).
4. Sarah Simpson, "The Arctic Thaw Could Make Global Warming Worse", *Scientific American*, May 17, 2009, see http://www.scientificamerican.com/article/the-peril-below-the-ice/, accessed on June 23, 2014.
5. Uttam Kumar Sinha, "The Arctic: An Antithesis", *Strategic Analysis* (Routledge: New Delhi, 2013), vol. 37, no. 1, p. 34.

questions regarding the territorial disputes and the politics and governance of the region.

Fig 1: The Countries Surrounding the Arctic Region

Source: "Permafrost in a Warming World", *Weather Underground*, see http://www.wunderground.com/resources/climate/melting_permafrost.asp, accessed on June 24, 2014.

Geo-political Relevance of the Arctic Region

As mentioned above, global warming has resulted in opening opportunities for the Arctic countries. The Arctic is important for many reasons, mainly its natural resources, the viability of new shipping routes, and for carrying out scientific and military research. Although there is no clear data on the

precise volume of resources that lie under the ice cover, estimates are that the Arctic could contain almost 30 percent of the world's undiscovered natural gas and 15 percent of its oil.[6] According to the 2008 US Geological Survey assessment, the total undiscovered conventional oil and gas resources of the Arctic are estimated to be approximately 90 billion barrels of oil, 1,669 trillion cubic feet of natural gas, and 44 billion barrels of natural gas liquids.[7]

In addition, there is also the possibility of opening up of new sea routes for maritime commerce. The Northern Sea Route along the coast of Russia is considered a vital route which could be 40 percent faster than the traditional Suez Canal for ships to travel from the European countries to the Asian countries. Since the route falls under the Russian territory of the Arctic, it will be interesting to see what benefits Russia can derive out of it. The Northwest Passage between Greenland and Canada comprises a similar case. Although the passage has become a zone of contention between Canada and the United States (over the sovereignty issue), the passage holds the possibility of significantly speeding the cargo travelling between the Dutch shipping hubs of Rotterdam to the ports of California.[8]

As mentioned earlier, the Arctic is also considered a viable region for conducting scientific and military research. Scientific research is largely associated with understanding climate change and its impact on the Arctic environment. For this purpose, the International Study of Arctic Change (ISAC) was established in 2003 by the International Arctic Science Committee and the Arctic Ocean Sciences Board to keep a check on, and provide accessible scientific information for responding to, the rapid climate change.[9] The data can be used to address the problems of droughts,

6. Frédéric Beauregard-Tellier, "The Arctic: Hydrocarbon Resources", Parliament of Canada, October 24, 2008, see http://www.parl.gc.ca/content/LOP/researchpublications/prb0807-e.htm, accessed on June 5, 23, 2014.
7. Ronald R. Charpentier, T.R. Klett, and Emil D. Attanasi, "Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas North of the Arctic Circle", U.S. Geological Survey, see http://www.anwr.org/images/pdf/USGS_Oil_gas_Arctic_2008_estimate.pdf, accessed on June 23, 2014.
8. Deb Riechmann, "So, How Important Is The Arctic?", *The Huffington Post*, January 1, 2014, see http://www.huffingtonpost.com/2014/01/01/how-important-is-the-arctic_n_4526951.html, accessed on June 23, 2014.
9. "International Study of Arctic Change", see http://www.arcticchange.org/about, accessed on June 23, 2014.

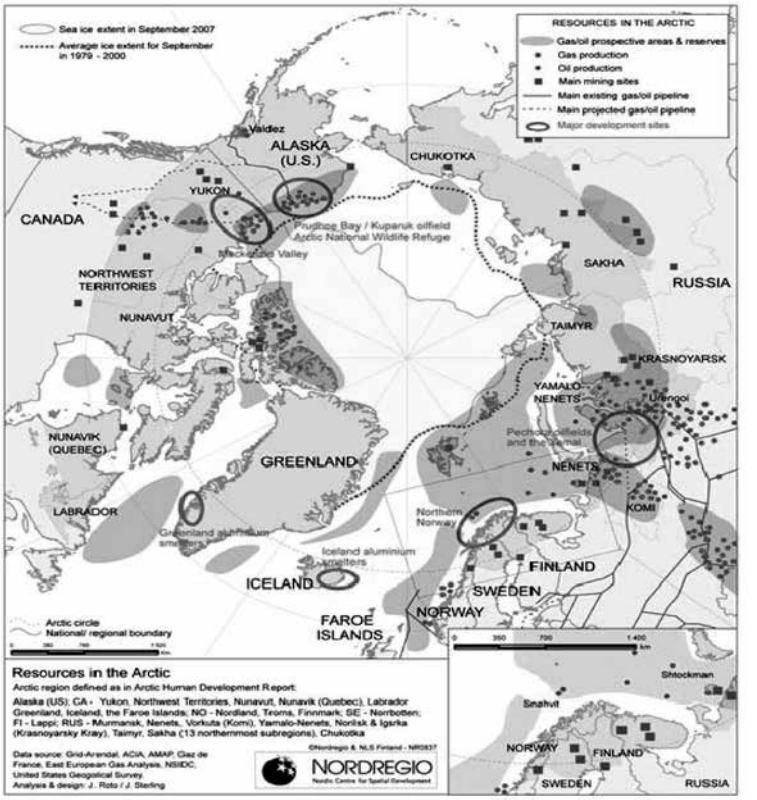
floods, winds and frosts in the areas which have similar climatic conditions. Furthermore, the information is also vital for understanding ocean currents and their impact on land climate and topography.[10]

In matters of defence research, there are a few examples that signify the importance of the Arctic. One example is that of the Defence Advanced Research Projects Agency's (DARPA's) Assured Arctic Awareness programme. The vastness and isolation of the region make it a suitable place for carrying out high-tech military equipment research. DARPA's Assured Arctic Awareness programme plans to develop sophisticated technologies to monitor the region, using the distributed advanced sensor system.[11] The advanced sensors would be able to catch even the slightest change on or below the ice surface. The technology would not only be cost efficient and time saving but would also limit the need for human presence to monitor the region. Once tested under the harsh climatic conditions of the Arctic region, it can also be used to enhance maritime security in an affordable and accountable manner.[12]

Another example is that of Canada which is experimenting on high level underwater sensors under the programme initiated by the Defence Research and Development, the research arm of the Department of National Defence.[13] The programme aims at developing newer technologies like sensors, cameras, and radars for surveillance purposes. In addition, the technology can also be used to monitor the movements of vessels and identify aircraft passing over the surveillance area. Once proved effective, the improved technology can be used for matters related to military and security purposes.

10. "Significance of Arctic Research Expedition", see http://www.china.org.cn/english/features/40961.htm, accessed on June 23, 2014.
11. "Assured Arctic Awareness (AAA)", DARPA, see http://www.darpa.mil/Our_Work/STO/Programs/Assured_Arctic_Awareness_(AAA).aspx, accessed on June 23, 2014.
12. Ibid.
13. "Military Tests Arctic Surveillance Technology" *CBC News*, May 2, 2012, see http://www.cbc.ca/news/canada/north/military-tests-arctic-surveillance-technology-1.1171382, accessed on June 23, 2014.

Fig 2: Regions with Possible Deposits of Energy Resources.



Source: Johanna Roto & José Sterling, "Resources in the Arctic", *Nordregio*, 2011, see http://www.nordregio.se/en/Maps--Graphs/05-Environment-and-energy/Resources-in-the-Arctic/, accessed on June 23, 2014.

Territorial Disputes and Governance of the Region

Countries for long have made territorial claims over the Arctic region which have been contested by other regional powers. Amongst all the Arctic powers, Russia is certainly one of the most important players, due to the massive territory and water that is shared. The Russian Arctic stretches more than 4,000 miles east to west, comprising the entire northern coast of Eurasia. Given the huge territory, Russia has ongoing territorial disputes with countries like Denmark and Norway. Russia also had a territorial dispute with the United States over the Bering Strait which was brought

to a resolution in 1990 under the USA/USSR Maritime Boundary Agreement.[14] Russia's overall involvement and interest in the Arctic would be dealt with in the latter half of the paper.

Denmark's involvement in the Arctic is through Greenland and its province, the Faroe Islands. The claim made by Denmark extends up to the North Pole via the potentially rich Lomonosov ridge.

Canada too asserts exclusive rights, authority and privileges to the land masses of the Arctic Archipelago.[15] Canada has a territorial dispute with Denmark over the Hans Island [which is situated in the centre of the Kennedy Channel of the Nares Strait, between Canada's Ellesmere Island and Greenland (a territory of Denmark)]—both Canada and Denmark claim the territory to be theirs.[16] Canada also has a disagreement with the United States over the demarcation and segmentation of the Beaufort Sea. In addition, Canada also lays claim over the Northwest Passage which has drawn strong reactions from the United States and Russia that claim the passage falls under international waters.

Norway's claim over the Arctic territory includes the Svalbard Archipelago, with a total area of 64,000 km^2. Norway has a territorial dispute with Russia over the demarcation of the Barents Sea and Svalbard Island. In 2010, the countries ended their 40-year-long dispute by agreeing on the new maritime boundary in the eastern Barents Sea. Under the agreement, the disputed area of around 175,000 sq km will be divided into approximately two equal sized parts.[17]

Denmark's involvement in the Arctic is through Greenland and its province, the Faroe Islands. The claim made by Denmark extends up to the North Pole via the potentially rich Lomonosov ridge. Russia argues that

14. Vlad M. Kaczynski, "US-Russian Bering Sea Marine Border Dispute: Conflict over Strategic Assets, Fisheries and Energy Resources", *Russian Analytical Digest*, 2007, see http://www.css.ethz.ch/publications/pdfs/RAD-20.pdf, accessed on June 30, 2014.
15. "The Arctic: Canada's Legal Claims", *Library of Parliament*, October 24, 2008, see http://www.parl.gc.ca/content/lop/researchpublications/prb0805-e.pdf, accessed on June 26, 2014.
16. Ibid.
17. "Russia and Norway Sign Maritime Border Agreement", *BBC*, September 15, 2010, see http://www.bbc.co.uk/news/business-11316430, accessed on June 28, 2014.

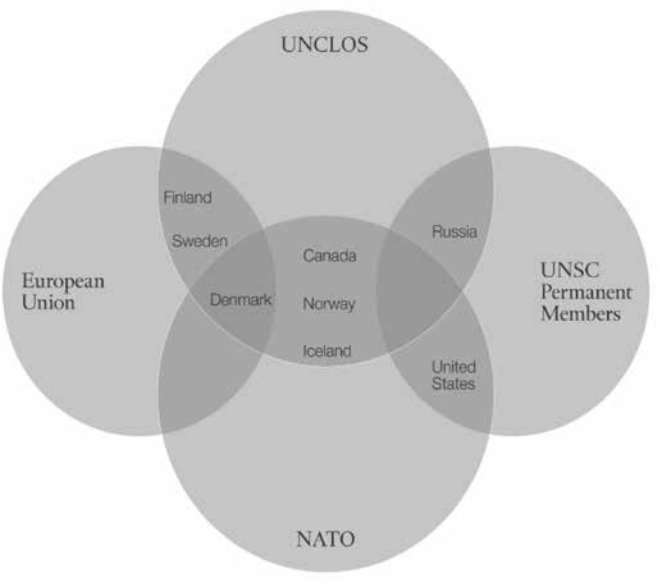
the ridge is geographically linked to the Siberian platform, while Denmark and Canada maintain that the ridge is an extension of the North American continental shelf.[18] Denmark has also carried out investigations to see if the ridge is geologically connected to Greenland. Another dispute is over the Hans Island with Canada. However, there have been plans to divide the island into two equal parts and end the political stalemate. The boundary drawn would run from north to south, connecting the existing maritime boundaries on either side of the island.[19] It will be interesting to see if the two sides agree on the settlement proposal, given the fact that the political complexities of agreeing are much more difficult than actually resolving the territorial dispute.

The United States' involvement in the Arctic is very interesting. It has not made any extended continental shelf claims and remains one of the most important industrialised countries that have not ratified the Law of the Sea (LOS) Convention. Without ratifying the treaty, the US not only loses its chance of claiming legitimacy over the extended continental shelf but also silences its voice over a number of key issues ranging from naval power, maritime commerce and international dispute resolution to maritime environmental protection and scientific research. It can also not be a member of the International Seabed Authority and, thus, cannot participate in the administration of the seabed mining panel. From the United States' perspective, it is imperative that the administration proceeds with ratifying the treaty, given the fact that the United States has potential claims to areas off the coast of Alaska, including the Beaufort Sea off the northern coast and the Chukchi Sea off the northwestern coast, as mentioned in the territorial dispute with Canada.

18. Adrian Humphreys, "New Proposal Would see Hans Island Split Equally Between Canada and Denmark", *National Post*, April 11, 2012, see http://news.nationalpost.com/2012/04/11/new-proposal-would-see-hans-island-split-equally-between-canada-and-denmark/, accessed on June 30, 2014.
19. Ibid.

International Governance

Fig 3



Given the territorial disputes between the countries, there was a need for a governing institution that can make settlements. The Arctic Council is the primary governing body designed to handle territorial disputes between the Arctic countries. The council came into existence through the Ottawa Declaration of 1996. It was formed as a high-level inter-governmental forum with the purpose of promoting cooperation, coordination and interaction among the Arctic states.[20]

The membership of the Arctic Council includes the eight Arctic countries that share territory in the region. Observer status is granted to non-Arctic countries which are approved by the council at the ministerial meetings that take place once in every two years. The countries which are awarded permanent observer status have no voting rights in matters related to Arctic governance. As of May 2013, there are 12 non-Arctic observer countries,

20. "Establishment of the Arctic Council", *Arctic Council*, April 27, 2011, see http://www.arctic-council.org/index.php/en/about-us/arctic-council/history, accessed on July 3, 2014.

which include India, China, France, Germany, Italy, Japan, South Korea, Netherlands, Poland, Singapore, Spain and the United Kingdom.[21]

The administration of the Arctic region is in accordance with the domestic laws and regulations of each Arctic state. The legal framework that governs activities in the Arctic is the 1982 UN Convention on the Law of the Sea to which most of the Arctic countries (except the United States) are entitled.[22] The United Nations Convention on the Law of the Sea (UNCLOS) has resolved a number of key territorial issues such as establishing freedom-of-navigation rights, setting territorial sea boundaries 12 miles offshore, setting Exclusive Economic Zones (EEZs) up to 200 miles offshore, establishing rules for extending continental shelf rights up to 350 miles offshore and creation of the International Seabed Authority.[23]

ROLE OF RUSSIA IN THE ARCTIC

> *The Arctic is an unalienable part of the Russian Federation that has been under our sovereignty for a few centuries, and it will be so for the time to come.*
>
> – Russian President
> Vladimir Putin.[24]

For Russia, the Arctic region is of great significance. It has more Arctic land, coastline and waters that any other country and, thus, is entitled to the benefits associated with the region due to climate change.[25] In December 2001, it became the first country among the Arctic powers to submit its extended continental shelf claim to the UN Commission on the Limits of the Continental Shelf. The document asserted claim over 1.2 million sq km of the Arctic Ocean,

21. "Observers", *Arctic Council*, April 27, 2011, see http://www.arctic-council.org/index.php/en/about-us/arctic-council/observers, accessed on July 5, 2014.
22. "The Emerging Arctic", Council on Foreign Relations, see http://www.cfr.org/arctic/emerging-arctic/p32620#!/, accessed on July 5, 2014.
23. Ibid.
24. "Putin Says Russia will Expand its Arctic Presence", *Business Standard*, October 3, 2013, see http://www.business-standard.com/article/pti-stories/putin-says-russia-will-expand-its-arctic-presence-113100301096_1.html, accessed on July 5, 2014.
25. Dylan Lee Lehrke, "The Cold Thaw", *IHS Jane's Defence Weekly* (UK: Warners Midlands Plc, 2014), vol. 51, no. 20, p. 27.

including the North Pole.[26] In 2007, Arctic researcher and Duma member Artur Chilingarov planted a flag in the High North region which created a political uproar among the Arctic powers. Russia's involvement in the region can be directly related to its long-term political, economic, and security goals, thereby ensuring its competitiveness in the international community.[27]

Economic Impact

Most of the energy giants in Russia are well aware that vast hydrocarbon deposits lie in the Barents and Kara Seas. As per current estimates based on geological surveys, the Arctic shelf north of Siberia contains almost 80 percent of Russia's unexplored hydrocarbon resources.[28] This, to a large extent, explains why Russia is so involved in the Arctic. It has been estimated that the Russian region is rich in resources like oil, natural gas, gold, diamonds, nickel, copper, platinum, iron and timber.[29] Although the region is home to less than 10 percent of the overall Russian population, it contributes approximately 20 percent to the Gross Domestic Product (GDP). Sixty percent of the raw materials exported comes from the high north region. Most resources located near the Russian coast are at a depth of under 500 m. As per the data published on Arctic reserves, some 200 potential natural gas fields have been discovered in the Barents, Pechora and Kara Seas.[30] Along with this, the Russian Arctic regions of the Kola Peninsula, Taimyr, Chukotka, Yakutia and Norilsk also have significant deposits of nickel (85 percent), copper (60 percent), tungsten (50 percent), rare earth elements (95 percent), tin (75 percent—known reserves in the Severo-Yanskoye field),

26. "Commission on the Limits of the Continental Shelf (CLCS), Outer Limits of the Continental Shelf Beyond 200 Nautical Miles from the Baselines: Submissions to the Commission: Submission by the Russian Federation", Oceans and Laws of the Sea, United Nations, June 30, 2009, see http://www.un.org/depts/los/clcs_new/submissions_files/submission_rus.htm, accessed on July 5, 2014.
27. Katarzyna Zysk, "Military Aspects of Russia's Arctic Policy: Hard Power and Natural Resources" in James Kraska, ed., *Arctic Security in an Age of Climate Change* (US: Cambridge University Press, 2011).
28. Timo Koivurova and Kamrul Hossain," Offshore Hydrocarbon: Current Policy Context in the Marine Arctic" *Arctic Transform*, 2008, see http://arctic-transform.org/download/OffHydBP.pdf, accessed on July 6, 2014.
29. Valery P. Pilyavsky," The Arctic: Russian Geopolitical and Economic Interests", F*riedrich Ebert Stiftung*, 2011, see http://library.fes.de/pdf-files/id/07925.pdf, accessed on July 6, 2014.
30. Ibid.

As for natural gas, there are more than 400 discovered onshore oil and gas fields in the Arctic Circle. More than two-thirds of these producing fields are located in the Russian Arctic region.

gold and silver (90 percent) and diamonds (99 percent—most of which are on the territory of Yakutia in the Arkhangelsk region and the Taimyr Autonomous Area).[31]

As for natural gas, there are more than 400 discovered onshore oil and gas fields in the Arctic Circle. More than two-thirds of these producing fields are located in the Russian Arctic region.[32] The estimated total oil production (including Sakhalin Island) could be about 55 billion barrels which would be about 16 percent of Russia's total oil reserves.[33] Even the Russian Natural Resources Ministry has stated that the parts of the Arctic Ocean which are claimed by Russia may hold more petroleum deposits, sufficient to surpass the potential oil reserves of Saudi Arabia.

Russia has already carried out various initiatives to extract oil from the Yamal Peninsula and the adjacent offshore areas. It also carried out its first offshore development project in 2013 in the Prirazlomnoye oil field south of Novaya Zemlya.[34] Russia's Gazprom Neft, the oil arm of gas producer giant Gazprom, shipped the first 70,000 tonnes of oil by tanker from the Prirazlomnoye platform, making it a successful venture.[35]

Russian interest in the Arctic is likely to increase in the coming years. This may be because the production in the traditional fields in Western Siberia has slowed down comparatively.[36] Another reason may be a more political and strategic one. For decades, Gazprom has controlled the gas coming out from the Central Asian countries, mainly Turkmenistan, Uzbekistan

31. Ibid.
32. "Oil & Gas", *The Arctic,* see http://arctic.ru/natural-resources/oil-and-gas, accessed on July 6, 2014.
33. Heli Simola, Laura Solanko and Vesa Korhonen, "Perspectives on Russia's Energy Sector" *Bank of Finland- Institute of Economies in Transition*, 2013, see http://www.suomenpankki.fi/pdf/172269.pdf, accessed on 6 July 2014.
34. Dmitry Gorenburg, "How to Understand Russia's Arctic Strategy", *The Washington Post*, see http://www.washingtonpost.com/blogs/monkey-cage/wp/2014/02/12/how-to-understand-russias-arctic-strategy/, accessed on July 6, 2014.
35. "Russia Ships First Oil from Disputed Offshore Arctic Platform", *Reuters*, April 18, 2014, see http://in.reuters.com/article/2014/04/18/russia-prirazlomnoye-oil-idINL6N0NA1C720140418, accessed on July 6, 2014.
36. Zysk, n. 27, p. 78.

and Kazakhstan. Gazprom purchased gas at heavily discounted rates and then resold the same gas to the European countries at a much higher price. However, in 2008, when the old contracts were about to end and the newer ones were to be established, the Central Asian gas procedures demanded an increase in the price that Gazprom should pay for new gas deals.[37] The global gas prices before the global economic meltdown of 2008 had been quite high. Since then, the market had seen a substantial drop in the demand for hydrocarbons. The price that Gazprom sells its gas for is less than what it was contractually obliged to pay to its Central Asian suppliers.[38]

Developing technology to carry out exploration in the Arctic required both time and resources and until that was done, the Arctic deposits would remain prohibitively expensive to explore. Now that exploring the Arctic has become a possibility, it would be interesting to see how Gazprom carries out its further operations.

There was a reason behind Gazprom taking such a decision. The purchases by Gazprom not only prevented a price war between the Russian and Central Asian suppliers to sell gas to the European countries, but also made sure that such competition did not suppress gas prices and profits, when Gazprom was already reeling from the serious effects of the financial crisis of 2008.[39] The other influential factor was the development of cheaper technologies for exploring and exploiting the untapped Arctic and East Siberian gas deposits. Developing technology to carry out exploration in the Arctic required both time and resources and until that was done, the Arctic deposits would remain prohibitively expensive to explore. Now that exploring the Arctic has become a possibility, it would be interesting to see how Gazprom carries out its further operations.[40]

37. Peter F. Johnston, "Arctic Energy Resources and Global Energy Security", *Journal of Military and Strategic Studies* (Canada: University of Calgary, 2010), vol. 12, no. 2, p. 5.
38. Ibid.
39. Danila Bochkarev, "European Gas Prices: Implications of Gazprom's Strategic Engagement With Central Asia", *Pipeline & Gas Journal,* (US: Oildom Publishing Company, 2009), vol. 236, no. 6, see http://pipelineandgasjournal.com/%E2%80%9Ceuropean%E2%80%9D-gas-prices-implications-gazprom%E2%80%99s-strategic-engagement-central-asia?page=show, accessed on July 7, 2014.
40. Ibid.

Navigational Routes

> *I want to stress the importance of the Northern Sea Route as an international transport artery that will rival traditional trade lanes.*
>
> – Vladimir Putin, President of Russia.[41]

Another important factor that drives Russia's interest in the Arctic region is the Northern Sea Route. The Northern Sea Route (a section of the Northeast Passage) that was created using ice breakers to reach ports from the Kara gate (the passage between the island of Novaya Zemlya and the mainland, which separates the seas north of Europe from those of Asia) eastward to the Bering Strait.[42] The route serves as an important transit point both from the point of view of the regional sea lines and as well as a trans-Arctic passage. Internally, the passage provides access to regional ports such as Novy port, Dikson, Dudinka, Igarka and Tiksi port. These ports have served as loading points for Siberian mineral and timber resources. During the summer, these ports are also used for coastal fishing and routine trade.[43]

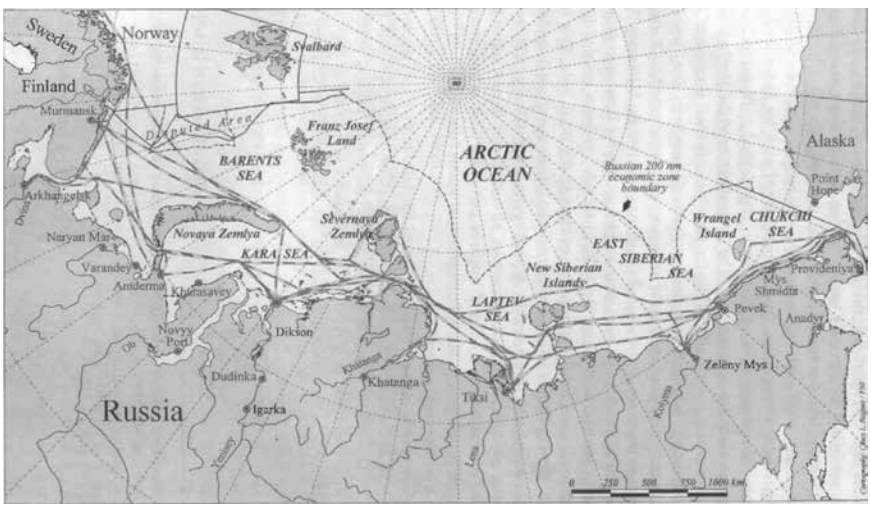
Apart from serving as a crucial point connecting the internal ports of Russia, the route also serves as an important trans-Arctic passage. Opinions have been raised for calling it an alternative route to the traditional lanes from the Baltic ports through the Suez Canal thereby connecting Europe and Asia in a much shorter time.[44] The journey from Yokohama to Rotterdam through the Northern Sea route can be reduced by about 4,000 miles. Even under terrible conditions, with possible slowdown in speeds, the ships can save a significant amount of fuel, by travelling through the shortened routes.[45] In addition, it also serves as an economical option by saving on cost on transit and service charges. Example: shipping from Murmansk to Vladivostok is twice as fast as that going by the Southern Seas. It saves a

41. EB Bryanski, "Russia's Putin says Arctic Trade Route to Rival Suez", *Reuters*, September 22, 2011, see http://www.reuters.com/article/2011/09/22/us-russia-arctic-idUSTRE78L5TC20110922, accessed on July 7, 2014.
42. Caitlyn L. Antrim, "The Russian Arctic in the Twenty-First Century", in Kraska, ed., n. 27
43. Ibid., pp. 113-114.
44. Ekaterina Piskunova, "Russia in the Arctic: What's Lurking behind the Flag?", *International Journal* (US: Sage, 2010), vol. 65, no. 4, p. 854.
45. Johnston, n. 37.

minimum of 10 days for cargo ships on the Hamburg-Yokohama line and up to 12 days on the Pechanga-Yokohama line.[46]

Russia's use of this passage has increased in the recent times. Soviet interest in the Arctic was at its peak during the 1980s, but after the breakdown of the Soviet Union, the transition from the Soviet Union to Russia resulted in neglect of the Northern Sea Route and the ports associated with it. Cargo business along the ports also saw a relative decline. In 2000, Putin brought back the attention that was deprived from the region. The Northern Sea Route featured as one of the key proponents in Russia's Arctic strategy. Certainly, the development of the ports around the passage shows the new vision of Russia's economic development strategy.[47] The passage was operationalised in 2009, when two German ships from the company Beluga Shipping GmbH travelled from Ulsan, South Korea, to Rotterdam, Netherlands.[48]

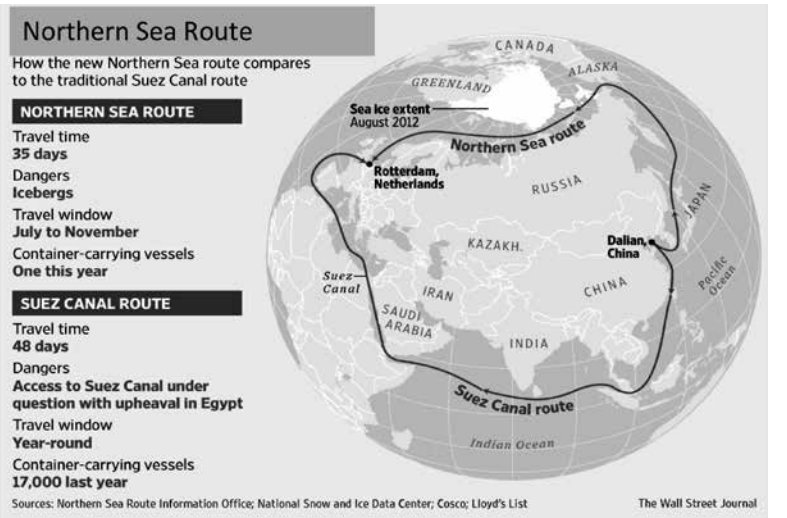
Fig 4: The Internal Waters of the Northern Sea Route



Source: Willy Østreng, "The Northeast Passage and Northern Sea Route", see http://www.arctis-search.com/The+Northeast+Passage+and+Northern+Sea+Route+2, accessed on July 7, 2014.

46. Ibid.
47. Bocharev, n. 39.
48. Matt Moore and Seth Borenstein, "Global Warming: 2 German Cargo Ships Pass Through 'Arctic Passage'", *The Huffington Post*, November 9, 2009, see http://www.huffingtonpost.com/2009/09/11/global-warming-2-german-c_n_283662.html, accessed on July 7, 2014.

Fig 5: Northern Sea Route



Source: John Stansfield, "Yong Sheng has Reached Rotterdam Sailing from Dalian Through the Northern Sea Route", *Vessel Finder*, September 11, 2013, see http://www.vesselfinder.com/news/1448-Yong-Sheng-has-reached-Rotterdam-sailing-from-Dalian-through-the-Northern-Sea-Route, accessed on July 7, 2014.

The Northern Sea Route will provide Russia with various benefits in terms of export, transit and domestic freight flows. Besides, Russia can conduct geological explorations of the seas, islands and archipelagos which have not been explored. Russia can also have a strategic edge over other countries as the passage would serve as the global transportation corridor. It will enable Russia to shape its position regarding freight turnover, the diversification of freight shipments from Europe to Asia, the Middle East and the Pacific.[49] In addition to that, Russia can also generate revenue from the nuclear icebreakers that escort the vessels through the passage.[50] Besides this, the passage will also play a crucial role in providing domestic supplies of commodities, food and raw materials, to the northern regions.

49. Kira Kalinina, "Russia Prioritizes Northern Sea Route as Fastest, Safest Way from Europe to Asia", *Voice of Russia*, see http://voiceofrussia.com/2014_03_01/Russia-prioritizes-Northern-Sea-Route-as-fastest-safest-way-from-Europe-to-Asia-7911/, accessed on July 7, 2014.
50. Andrew E. Kramer and Andrew C. Revkin, "Arctic Shortcut Beckons Shippers as Ice Thaws", *The New York Times*, September 10, 2009, see http://www.nytimes.com/2009/09/11/science/earth/11passage.html, accessed on July8, 2014.

Security

It would be inappropriate to say that the security aspect of the Arctic has warmed up only in the recent times. Even during the late 20th century, both the United States and the Soviet Union made extensive use of the Arctic region for their strategic military purposes. Both the North Atlantic Treaty Organisation (NATO) and the Soviet forces used the region for bases for their nuclear submarines and also for testing their intercontinental ballistic missiles. However, towards the end of the Cold War, from a strategic point of view, the Arctic region was given less priority. But the growing interest in the Arctic among countries has once again brought back attention to the region.

Ensuring security concerns in the Arctic has occupied a central position among Russia's strategic thinking community and defence policy makers. Russia maintains a strong military presence in the region with varied interests and activities. It is the only non-NATO country in the region with a vital interest in the region's wealth and resources. It also shares by far the longest coastline and constitutes the largest population. Most of the undiscovered natural wealth is supposedly in and around the Russian Arctic region. The opening of the Northern Sea Route and even the oil and gas pipelines in the northern and northwestern region of Russia along with the Baltic pipeline system and the Nord Stream gas pipeline add to the security build-up in the region. The national security strategy of the Russian Federation until 2020 describes the Arctic region as an area with the possibility of conflict (due to the varied interests of the different countries involved) and the possible use of military force to resolve crises in the region.[51]

Russia's ability to project power in the region has also increased. The increase in the defence budget since 2009 is a good example to understand Russia's assertive military dominance in the region. A large portion of the funds have been allocated to the navy which is currently constructing its Borei and Yasen class nuclear submarines. Russia has also trained several special forces units in Arctic warfare techniques. It has deployed a number of nuclear

51. Pauli Jarvenpaa and Tomas Ries, "The Rise of the Arctic on the Global Stage" in Kraska, ed., n. 27, pp. 136-139.

The Northern Fleet is based along the coastlines of the Barents and White Seas. The fleet is considered to be one of the strongest in the Russian Navy and was reinforced in the Arctic to cater to the need of additional military exercises.

missile carrying submarines, mostly the Delta–IV class, in the Arctic waters.[52] The Northern Fleet is based along the coastlines of the Barents and White Seas. The fleet is considered to be one of the strongest in the Russian Navy and was reinforced in the Arctic to cater to the need of additional military exercises. It has undertaken a series of patrol missions over the Arctic. The patrols are conducted through the Tupolev Tu-142 long range Anti-Submarine Warfare (ASW) and I1-38 medium range ASW aircraft, operating from air bases in the Murmansk and Vologda regions.[53]

Russia is also preparing two Arctic infantry brigades that will be equipped with all the special Polar standard personal equipment, clothing and vehicles to carry out full scale operations in the region. The military authorities are conducting tests to ensure the reliability and applicability of the equipment in the harsh weather conditions. An example of this is the upgradation of some Mil Mi-8 'Hip' transport helicopters with powerful engines, electric generators, ice protection systems and ski landing gear. In addition, Russia is also planning to construct a new air command centre, a replacement runway and a naval dock on Kotenly in the New Siberian Islands. It is also planning to reestablish 12 Cold War era air bases in the region.[54] All these actions, which are in line with the process of further strengthening the military infrastructure in the Arctic, have generated strong reactions from the other Arctic countries, mainly the US, which has deployed a number of nuclear power submarines in the Arctic waters. Both the US and Canada also maintain a strong air defence system with early warning and missile tracking radars that provide comprehensive

52. Rob Huebert, "Canada and the Newly Emerging International Arctic Security Regime", in Kraska ed., Ibid., p. 210.
53. Leheke, n. 25, p. 28.
54. Ibid.

surveillance and security of the region.[55]

Although Moscow's actions in the Arctic reflect an increasingly assertive foreign policy, the Russian actions as of now, have remained within the boundaries of international law. However, this does not rule out the possibility of confrontation between the regional powers in the near future.

CHALLENGES FOR RUSSIA IN THE ARCTIC

As much as there are opportunities for Russia in the Arctic, the cold desert also holds some challenges. The challenges are largely to do with the lack of sophisticated technology in oil drilling and gas exploration, environmental issues, dispute over the Northern Sea Route (with the US and EU claiming that the route passes through international straits), and the growing presence of foreign powers, especially China, which has the potential of changing the geo-strategic environment of the region.

The obvious challenge for any country to carry out exploration in the Arctic is the climate, which is very uncertain. The temperatures are extremely low, with extensive dark periods in winters. The presence of icebergs along with sea ice and the remote places of extraction make the region an extremely difficult place to work in.

The obvious challenge for any country to carry out exploration in the Arctic is the climate, which is very uncertain. The temperatures are extremely low, with extensive dark periods in winters. The presence of icebergs along with sea ice and the remote places of extraction make the region an extremely difficult place to work in. There is also the need for advanced technology to carry out drilling and exploration.[56]

55. James Jay Carafano., Ariel Cohen, Sally McNamara and Richard Weitz, "EUCOM Should Lead U.S. Combatant Commands in Defence of National Interests in the Arctic", *The Heritage Foundation*, March 28, 2011, see http://www.heritage.org/research/reports/2011/03/eucom-should-lead-us-combatant-commands-in-defense-of-national-interests-in-the-arctic, accessed on June 8, 2014.
56. "Climate Change in the Arctic Region: Between Opportunities and Challenges", *Climate Policy Watcher*, May 12, 2013, see http://www.climate-policy-watcher.org/?q=node/509, accessed on July 9, 2014.

Russia's exploration activities do face a lot of technological challenges. Right from the time of the Soviet Union, most of the oil and gas exploration has been on land. The energy acquired was transported through land-based pipelines to most of the Western European pipelines. The petroleum industry specialised in land-based extraction. Even the experience of the people, the infrastructure, machinery and science and technology have all been focussed towards land-based energy exploration. Adventuring in the north would mean working along the coasts or at sea. Although Russia has consolidated itself in the international community with its energy markets, it has only made decent economic progress and may have to struggle to invest huge funds in developing new and advanced technology.

Coping with these challenges would require foreign investment in terms of providing both technical advancements and monetary assistance.[57] Another important issue that can emerge could be of the organisational capacity and capital. Estimates have been made that by 2030, Russia's continental shelf would require massive infrastructure to explore as well as transport 110 million tonnes of oil and 160 billion cubic metres of gas annually. The volume of resources to be extracted, as per the estimate, would require construction of nearly 60 new oil rigs along with other technical infrastructural requirements. This could cost around some two trillion roubles.[58]

Another challenge is the distribution of licences to foreign companies. Rosneft and Gazprom, the two state owned companies, have the right to explore and develop oil and gas deposits on the Arctic continental shelf. Both companies, however, lack the capacity and technical capability to exploit the Arctic to its full limits. The Russian government understands the complexity involved and is now encouraging foreign investors and companies to enter into joint ventures with Rosneft or Gazprom. An example of that could be the agreement between Rosneft and ExxonMobil to set up a

57. Indra Øverland, "Russia's Arctic Energy Policy", *International Journal* (Canada: Sage, 2010), vol. 65, no. 4, pp. 870-872.
58. Ibid.

joint research centre and also share the necessary technology required. The companies are cooperating to explore and develop the three blocks of the Kara Sea and one block of the Black Sea.[59]

Predicting the trend of the international energy market can also be a challenge for Russia. Explorations in the Arctic are expensive and are largely affected by the market trend of the global energy demand. Recently, Gazprom, one of the biggest energy giants, called off its flagship project of developing the vast Shtokman gas field in Russia's Barents Sea. The decision was taken due to excessive cost, lack of technology and cataclysmic changes in the international gas market caused by the North American shale gas revolution, which made the exploration both expensive and unfeasible.[60]

There are also issues pertaining to the environment of the Arctic. Explorations in the Arctic can destabilise the Arctic ecosystem. Russia has often faced strong criticism from environmental groups and activists such as Greenpeace regarding the oil drilling projects and spillage in the Arctic. As per the Greenpeace report, nearly five million tonnes of crude oil is spilled in Russian oil fields every year. The report also claims that Russia burns around 40 billion cubic metres of gas annually.[61]

Oil spillage in the Arctic is dangerous because unlike in warm water, oil remains in the Arctic environment for a longer period of time. The evaporation rate is also much slower due to the extremely cold climate, which can seriously affect the habitat of the region, thereby endangering the ecosystem. Adding to that, the sub-zero temperatures, poor visibility and blackouts (most of the time), make it difficult to effectively implement or undertake clean-up activities.[62] Serious concerns have been raised against Russia's activities. Some maritime scientists have also drawn the conclusion that the rate at which the explorations are taking pace, especially in the

59. Simola, et. al., n. 33, p. 12.
60. Guy Chazan," Gazprom Freezes Arctic Gas Project", *Financial Times*, August 29, 2012, see http://www.ft.com/intl/cms/s/0/ab331568-f1d8-11e1-bba3-00144feabdc0.html#axzz36whEICOa, accessed on July 9, 2014.
61. "Russia Oil Disaster", *Green Peace International, see* http://www.greenpeace.org/international/en/campaigns/climate-change/arctic-impacts/The-dangers-of-Arctic-oil/Black-ice--Russian-oil-spill-disaster/, accessed on July 9, 2014.
62. "Oil Spills", *Oceans North*, see http://www.oceansnorth.org/oil-spills, accessed on July 10, 2014.

Russian Arctic, can result in devastating consequences for the pristine region.[63]

Even in terms of operationalising the Northern Sea Route, Russia faces tough challenges, which include developing infrastructure alongside the route, building and expanding ports facilities, building new ice breakers and improving the overall operational services. The ice-free port of Murmansk for long has been envisaged as an important economic component of the Russian maritime Arctic. There have been reports which suggest that the headquarters of the Northern Sea Route may be moved from Dikson to Murmansk. If that is the case, there is serious need for developing the Murmansk port. A more advanced marine infrastructure needs to be planned with advanced satellite systems, advanced research vessels, efficient navigational facilities and repair and maintenance centres. Plus, Russia would also need to build and improve the existing fleet of ice breakers. The Russian nuclear powered ice breaker fleet under the state owned Atomflot may signify the legacy of the Soviet Union but lacks the technology required to work in the extreme conditions of the region. The Russian Federation has undertaken several plans to modernise the fleet, build dual draft ships which can operate along the coastal waters of the Northern Sea Route and in the Siberian waters.[64]

The Arctic has not only opened opportunities for the littoral countries, but also lured other countries which now see it as a lucrative region for energy resources and profitable navigational routes. Among the players that eye the Arctic, China has been the more assertive one. Even though, China does not possess any territory in, or bordering, the Arctic region, it has shown considerable interest in it mainly because of the resources and the easy navigability from the new route.[65] The new shipping route would cut down the distance by almost 2,800 nautical miles from Rotterdam to

63. Fiona Harvey and Shaun Walker, "Arctic Oil Spill is Certain if Drilling Goes Ahead, says Top Scientist", *The Guardian*, November 19, 2013, see http://www.theguardian.com/world/2013/nov/19/arctic-oil-drilling-russia, accessed on July 10, 2014.
64. Lawson W. Brigham, "Russia Opens Its Maritime Arctic", US Naval Institute, see http://www.usni.org/magazines/proceedings/2011-05/russia-opens-its-maritime-arctic, accessed on July 10, 2014.
65. Johnston, n. 37, p. 19.

Shanghai with an initial cost savings of 30-40 percent or $60 to 120billion annually.[66]

China's keen interest also lies in the resources, including oil and natural gas, rich fishing waters, rare earth deposits and hydrocarbons. In order to promote its interest, China has undertaken various steps.[67] China has signed a number of bilateral agreements: examples of these could be the 2013 free trade agreement with Iceland or the improved diplomatic representation in the Nordic region. Although Iceland is not an aggressive country in the region, the agreement has helped China project its image in the Arctic. Similarly, China has also entered into several ventures with Greenland. China provides a lot of private investment in the mining industry in Greenland.[68] Quite recently, the China National Offshore Oil Corporation, signed a deal with Russia's second largest gas producer Novatek to build equipment for a liquefied natural gas project in Siberia. Besides this, the China National Petroleum Corporation (CNPC) has also sealed a deal to buy 3 million tonnes of LNG per year from the Yamal project.[69] In 2010, it leased a dock at North Korea's Rajin Port for 10 years,[70] and has invested more than $10 billion in building infrastructure, which many believe could serve as a potential hub for Arctic transport in the future.[71]

Besides China's economic interest in the Arctic, there are also environmental concerns which draw its attention in the region. China is worried about the changing weather patterns which can result in rising sea levels and food security problems. The security concerns have led

66. "Short and Sharp", *The Economist*, June 16, 2012, see http://www.economist.com/node/21556803, accessed on July 10, 2014.
67. Juha Käpylä and Harri Mikkola, "The Global Arctic: The Growing Arctic Interests of Russia, China, the United States and the European Union" Finnish Institute of International Affairs, November 8, 2013, see http://www.isn.ethz.ch/Digital-Library/Articles/Detail/?id=172671, accessed on July 10, 2014.
68. Ibid.
69. "China, Russia Sign $1.6Bn Deal on Siberian LNG Project", *The Moscow Times*, *Reuters*, July 10, 2014, see http://www.themoscowtimes.com/business/article/china-russia-sign-16bln-deal-on-siberian-lng-project/503249.html, accessed on July 11, 2014.
70. Sunny Lee, "China's Acquisition of Sea of Japan Port Rattles its Neighbours", *The National*, March 14, 2010, see http://www.thenational.ae/news/world/asia-pacific/chinas-acquisition-of-sea-of-japan-port-rattles-its-neighbours, accessed on July 11, 2014.
71. Margaret Blunden, "Geopolitics and the Northern Sea Route", *International Affairs* (UK: Blackwell Publishing, 2012), vol. 88, no. 1, p. 127.

Russia has been keenly involved in the region due to the economic and strategic benefits that it wishes to derive. However, the uncertainty regarding the access to the undersea resources will continue to be a big concern for the Russian Arctic decision-making body.

China to invest in research programmes and promote international cooperation in scientific research on key environmental issues. China has also been involved in the governance of the Arctic region. In May 2013, it was awarded permanent observer status which portrays its idea of the Arctic not being limited to the littoral countries.[72]

FUTURE PROSPECTS FOR RUSSIA IN THE ARCTIC

There is no doubt that the Arctic is transforming into a region which has great geo-political and strategic significance. The economic prospects seen in terms of resources and maritime routes have not only offered opportunities to the Arctic countries but also lured other international players, which now consider the region as strategically important. Russia has been keenly involved in the region due to the economic and strategic benefits that it wishes to derive. However, the uncertainty regarding the access to the undersea resources will continue to be a big concern for the Russian Arctic decision-making body. The cost of developing the offshore oil and gas operations is also relatively high. If Russia does manage to build the required infrastructure, it will need to strengthen or even build a new pipeline network that could transport oil and gas from the offshore Yamal region to Europe either via the Baltic pipeline system or the Yamal-Europe pipeline. These developments would come with a big price tag and the need for advanced and sophisticated technology.

Even the cost factor for exploring and transporting oil and natural gas through the Northern Sea Route needs to be taken into consideration. Estimates have shown that exploration can only be profitable when the oil price remains over $100 to 120 per barrel. As for the navigability through the Northern Sea Route, it has been minimal at the present time. Even though

72. Kapyle and Mikkole, n. 67.

there has been reduction in the ice cover during the summer, the possibility of thick ice and extreme weather conditions remains during winter. Using ice breakers for navigating is one preferable option but even ice breakers slow down during navigation through multi-layered ice chunks. The route is also narrow which can increase the transit time and make the journey expensive. Russia needs to foresee all these challenges and formulate a strategy which calls for greater cooperation among the countries and major energy companies, and share the necessary technology required for making the Arctic a profitable venture.

Russia and China have good relations and they can carry that forward in the Arctic. Recent developments in terms of energy deals and agreements serve as examples of how the strategic partnership can go ahead.

As for the international factor (mainly China), the question is of how Russia perceives China's involvement in the region. Russia can either develop strategic ties with China, and counter-balance the NATO alliance or vice versa, counter-balance China's rise in the region. Russia's decision to align on either side would depend upon the strategic thinking of the administration. However, there are certain reasons which can make the Russia-China Arctic partnership a more feasible one. Russia and China have good relations and they can carry that forward in the Arctic. Recent developments in terms of energy deals and agreements serve as examples of how the strategic partnership can go ahead. Even economically, both countries can benefit by coming together. While on the one hand, the Northern Sea Route will shorten the distance for Chinese cargo to travel to Europe; on the other, it will also provide the Russian domestic ice breaker fleet with sufficient work, resulting in a source of income. Plus, the two countries can also come together on a joint venture for developing nuclear power ice breakers.

Coming to the question of unresolved territory disputes and claims turning into conflicts, the possibility of such an occurrence is relatively low. So far, the countries have abided by the UNCLOS and the regulations of the Arctic Council to resolve territorial disputes between them. A case in

point is the Norway-Russia peaceful border settlement, which shows that the countries have realised that they can benefit more by cooperation than by confrontation. Russia can also use the soft balancing strategy to form relations with strong Arctic players like Canada and Norway.

There have been a few examples which can justify such an approach. The Shtokman gas field, for instance: when Russia opened the platform for foreign partners, various American companies like Chevron, Conoco Phillips and as well as British Petroleum submitted their proposals. However, their proposals were declined without giving much of an explanation and instead the tender was given to Norway's StatOil with a 25 percent stake in exploring the gas field. This approach can be seen in two ways. Firstly, Russia wanted to protect itself from the American threat by keeping one of the most important energy fields under its control and, secondly, by awarding the deal to Norway, Russia not only got the much needed technology that it needed but also a valuable ally.

Even with Canada, Russia has not been vociferous in terms of opposing the former's claims over the Northwest Passage. Both countries are interested in avoiding the internalisation of the passage, as mainly suggested by the United States. It will be interesting to see if the incentive of supporting the Canadian claim over the passage would be enough to overcome the existing divergences and form a good strategic partnership.