EDITOR'S NOTE

The last three months have been as significant as any in the recent history of our country. The year 2014 ended with the drawdown of US-NATO forces from Afghanistan with many opining that the 'job' was only half done or less. There are legitimate fears of instability in the region that could spill over to other parts of South Asia and Central Asia. India is naturally concerned that the situation does not take an ugly turn that will be of detriment to us. The internal and external pulls and pressures are many that encompass terrorism, trade, diplomacy and power politics. The situation merits continuous monitoring for some time to come. Some contingency planning will also be in order.

The visit of President Obama in January was a momentous event. Apart from the fact that he was the first US president to be the chief guest at our Republic Day parade, the visit signalled that the strategic partnership was well on track. There was the very apparent bonhomie between the leaders of the two countries and the mutual understanding on a host of different issues, including the "vision document", was clearly noted by our friends and possible adversaries. President Obama's commitment to support our "Make in India" programme was very welcome and so was the desire for furtherance of the Defence Trade and Technology Initiative. However, the Americans, once again, were insistent on our signing the three "foundation pacts" viz the Logistics Support Agreement (LSA), Communication Interoperability and Security Memorandum Agreement (CISMOA) and Basic Exchange and Cooperation Agreement for Geo-spatial Cooperation (BECA). Our signing the three agreements has been debated for over ten years now. The implications are self-evident. Our reticence is understandable as the agreements could impact our relations with other countries. Also, there is some danger that our security interest could be compromised. On the other hand, not signing the agreements will mean that equipment and services that would be operationally advantageous would be denied to us. Indeed, that has happened in the recent past. If we

are not to deny ourselves the full gains of a strategic partnership, it may be advisable to start a dialogue on the subject and accept only those conditions that we can live with. Some compromises will be necessary but we could insist that we will sign the required agreements, with modifications as agreed to, on a case by case basis. Such an approach should be acceptable.

The 10th edition of the biennial International Aerospace Exhibition "Aero India", was held in February 2014. The exhibition attracted considerable interest and a record number of aerospace companies participated. There were as many as 328 foreign companies and 266 Indian companies that took part. The corresponding figures for the last such exhibition, "Aero India 2013" were only 212 and 266 respectively. The presence of so many well known companies was encouraging but, unfortunately, no orders or contracts ensued. Apparently, our "Make in India" call has been heard but much work still needs to be done.

On the last day of February, the annual budget was duly rolled out. By and large, the budget was well received but the defence budget excited comments that were to be expected from those who have neither the professional expertise in, nor the responsibility for, any aspect of national defence. It is true that the defence budget is a mere 1.74 percent of projected Gross Domestic Product (GDP) and only 11 percent of government expenditure. However, such figures can be misleading and it is necessary to determine how we intend to spend the moneys and whether the incremental capabilities that should result will best meet the projected threats to our national security. A more detailed examination of how we spend the defence budget is long overdue. One wonders when such an exercise will become the necessary prelude to the fashioning of the defence budget.

As usual, this edition of the *Journal* addresses a number of issues related to national security. National security is a complex subject and comprises a vast number of varied considerations. It is our hope that we continue to raise issues that merit examination and study.

Happy reading

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CHANGING NATURE OF WAR

SHEKHAR SINHA

Beyond the immediate, we are facing a future where security challenges will be less predictable; situations will evolve and change swiftly; technological changes will make responses more difficult to keep pace with. Threats may be known but the enemy may be invisible.

Control of space becomes as critical as that of land, air and sea. Full scale wars may become rare, but force will remain an instrument of deterrence influencing behaviour and the duration of conflicts will be shorter.

We should remember that what matters is the capability of the force…….. When we speak of digital India, we would also like to see digital armed forces.

– Prime Minister Modi to the Combined Commanders

To my mind, this sums up the present and the future direction for the armed forces and other security and intelligence agencies. The concept of nationhood is not very old in India and, therefore, one has to learn from history: after all, the human race is essentially the same except that it is evolving all the time, refining its way of thinking all the time.

Let me attempt to provide a canvas of the historical perspective of warfare. One example is the Iraq War, not the present one. The USA swept away the Iraqi Army in a few days, and thought victory had come; unfortunately,

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Rapid technological change also radically altered the nature of how wars were to be fought.

the assumption about the nature of this war was a faulty one. The planning was done based on the experience of previous wars. Lessons from past wars have limited utility in the future. Were the Americans intellectually impaired, institutionally misdirected or, perhaps, constitutionally impaired to act decisively?

If you have read Clausewitz, you will be familiar with what he has often said, "War is politics by other means." I would say war and politics are expressions of sociology, they grow out of the social conditions of their time and place though the reasons may never be identical. Let me explain why I say this: the theme of the modern world has been shaped by the English Civil War, which marked the end of wars of religion and the beginning of secular ones. Science helped fuel the intellectual and industrial revolutions, and, as a consequence, emerging doctrines of individual conscience and governments based on social content rather than divine right; the establishment of the idea of the sovereign state within a system of states, birth of nationalism, of an idea of countries based on common, shared identity rather than as personal holdings of dynastic families. Changing sociology produced a new style of warfare which was demonstrated by the American Revolution.

Rapid technological change also radically altered the nature of how wars were to be fought. Added to that, the industrial revolution and innovations put vast powers into the hands of states, particularly in the areas of mobilisation, communication, transportation and logistics support, enabling the creation and sustainment of mass-based armies, equipped with a bristling array of weaponry whose inherent efficacy forced further innovation in tactics, techniques and procedures in a self-reinforcing process that has marched down the intervening years.

THE TRIUMPH OF MODERN WARFARE

The apogee of this process was World War II. It was the highest expression of the art of modern war. Many technological changes have taken place but very little has changed since World War II as far as sociological

underpinnings are concerned. It is the paradigm of modern war and experience of it that shapes a country's strategic military thinking and planning, particularly the Western model. If you examine it closely, you may conclude that despite all the talk of transformation, this is old wine in a new bottle.

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Sociology is changing and so is the nature of warfare. We generally plan to refight the previous war. This is what we understand as to what to do and how to do it.

Let me now take you to another example, the Vietnam War. My view is that the strategist Clausewitz remained in obscurity outside Germany for many years after his death and came to prominence in the US only after the Vietnam War. I get the impression that he was more quoted than read, and if read, then less understood. The Vietnam War was a profound shock, not only for the US as a whole but most especially for the military. The perceived defeat in Vietnam deeply affected the military's self-image. This led to introspection by the US and analysis by the world powers.

Col Summers, a well known US thinker, has summed it up by saying that America lacked a war-winning strategy in Vietnam largely as a result of the military having surrendered strategy-making to civilians who produced concepts of limited war, which meant that the military instrument of strategy was not understood and, consequently, misapplied to goals it was not designed for, a fault Clausewitz had warned against. Military failure was a strategic failure and the blame for that lay with the civilians who had come to dominate strategic thinking without having an appreciation of the military instrument.

MODERN WARFARE

The military had also failed to appreciate the nature of insurgent warfare and tried to turn Vietnam into replay of World War II in the jungles!! Reform of how the military should conduct small wars was needed. The military carried out a major study on manoeuvre warfare and the operational art of

war—building on Clausewitz and the German Army's experience in World War II. The study influenced doctrine development and military reform which reflected the deepest institutional prejudices within the military and its aversion to non-traditional forms of war-fighting.

Two strategists have brought out this aspect, one being Clausewitz. He often said, "War is, thus, an act of force to compel our enemy to do our will."

The second is William J Olsen of the National Defence University (NDU) of the US who has written: "While the nature of warfare is changing... but policy, strategies and instructions that develop and implement them have not understood or adjusted to the changing nature of war. We have moved from the era of Modern War into the era of Post Modern War, into an age of war without a Centre of Gravity."

The views of some more researchers on this subject are worth examining. Mary Kaldor has argued that war in the past decade has changed into something completely new. Globalisation of the economy in combination with the pursuit of exclusionary identity politics has removed the difference between war and peace, crime and war, and between war and systematic abuse of human rights in a growing number of conflicts. Some others have argued that the new features of modern war – precision guided munitions and network-centric warfare are signs of a Revolution of Military Affairs (RMA). Some others have come to the conclusion that the use of smart bombs and air power has made war virtually a post-modern spectator sport for the Western countries.

Quantitative studies indicate that during the Nineties, over 90 per cent of armed conflicts took place within states rather than between states. There is a high degree of correlation between so-called modern war and low intensity conflict or "non-state war". I would summarise to say that there are at least three debates on the changing nature of war.

First: It deals with non-state warfare. Now the question is: is there something new in this?

Second: RMA contends that the way future wars (and some current ones) will be fought is new.

Third: Called post-modern war. It states that war has become virtual.

As far as Clausewitz's writings go, it suggests that war consists of a trinity made up of the people, the government and the armed forces. War comprises, and balances between, creative forces (symbolised by the armed forces action), rational forces (symbolised by the government) and emotional forces (symbolised by the people). Essentially, it means that the armed forces are separable from the people (who do not take part in fighting) and from the government, which leads the war. Obviously, Clausewitz's analysis was influenced by the military and political context in which he lived.

Some of the internal wars have demonstrated differences from insurgent wars as far as clear military objectives are concerned. The fighting forces are irregulars which display absence of even an appearance of military order and discipline; resulting in a level of ferocity and even atrocity that is routinely committed in these conflicts.

When it comes to terrorism, Jerrold Post suggests that terrorism as an intentional act selected from a range of perceived alternatives is understood as rational. It is a psychological set-up that predisposes some to be drawn towards extreme groups and extreme rhetoric. However, this argument is not compatible with rationalist accounts of terrorism or modern warfare.

What then are the characteristics of modern war? One school of thought is that modern war is inclined to target the civilian population. Global trade links are used to support the armed movements fighting in this war, and the enemy often becomes invisible. This is what makes differentiation between war and peace blurred. Some suggest that war may be continuation of economics by other means. This does not mean that wars are caused by economic shortcomings – rather that the conduct and continuation of wars are determined by economic incentives. These are akin to the wars during the Middle Ages.

While justifying the RMA, it is often said that the ability to collect, communicate, process and protect information is the most important factor defining military power. In the past, armour, firepower, and mobility defined military power, but now it often matters less how fast you can move or how much destructive force you can apply. Stealth trumps armour, precision trumps explosive force and being able to react faster

Stealth trumps armour, precision trumps explosive force and being able to react faster than your opponent trumps speed.

than your opponent trumps speed. My own take is that the Western powers are reluctant to become militarily involved unless they enjoy overwhelming superiority in military, especially technological, power. Further, the increasing dependence on air power and precision-guided munitions of the West is an attempt to take death out of wars not only by reducing own losses through the predominant use of air power in the conduct of war but also by minimising collateral damage. This has led to development of non-lethal weapons which may be a futile attempt at the end. Surely removal of death from wars may also make the post modern war occur more frequent as society becomes disconnected with the decisions, conduct and suffering in war.

Some strategists like Smith, Duyvesteyn and Stathis Kalyvas have analysed, and concluded about, three different types of civil warfare roughly corresponding to, though not perfectly correlated:

- Conventional warfare that exists in secessionist conflicts.
- Irregular warfare that is intimately linked with rural insurgencies.
- Symmetric conventional warfare that is in some way connected to state collapse.

These theories are subject to further research. In some wars, there was some ground to the argument of war being a tradition of civil military coordination, anti-guerilla, interdiction through intelligence operations and, most importantly, a willingness to negotiate limited political compromises with the adversary possibly from a position of strength or a stalemate situation. (e.g. Malaya, Kenya, Cyprus and Northern Ireland). This probably emerged from the British colonial burden of policing.

Let me put it this way: when political actors seek intangible, rather than purely physical, outcomes through military action, strategic analysis becomes far more intricate because it requires an acute appreciation of the ambiguities and complexities of the socio-political environment in

which these conflicts occur. The key problem is that democracies handle such conflicts very poorly, says Eliot Cohen.

There are well defined centres of gravity at different levels of strategic, tactical and operational respectively.

Broadly speaking, conventional warfare in military terms is best understood by defining it:

- There are well defined centres of gravity at different levels of strategic, tactical and operational respectively.
- There is a clear distinction between combatants and non-combatants.
- Operations are carried out by a large number fighters who fight in the sectors or specified areas.

GLOBALISATION AND CONFLICTS

There have been many researchers who have linked globalisation to increased conflicts. From the time the Cold War ended, it has been a process of a reverse of real globalisation in the form of the spread of American power, ideas and institutions on a global scale. This Anglo-Saxon economic and ideological hegemony is unlikely to continue without growing international political and ideological resistance, and, indeed, one major form that this has begun to take is that of international terrorism led by the Al Qaeda network.

One can visualise the current phase of US unipolar domination of the international system as a transitional one, and ultimately, a new balance of power will reassert itself – China is a strong possibility. However, the overwhelming military superiority of the United States over its international rivals makes this an unlikely prospect in the near future. Authentic globalisation has yet to develop out of its US and Anglo-Saxon dominated form, certainly on lines that can lead to the entrenchment of democracy at the world level.

The future may be rather more fluid, with continued centrality of inter-state warfare. The breakdown of weak states has not ensured the domination of a completely new form of war, since the warlord factions are both supported in many cases by states and themselves seek the control of states as an ultimate political goal. Therefore, we are possibly going through

a transitional period, in which a number of weak states that were supported by large scale patrons during the Cold War, now have to struggle to survive in a rather insecure international political order. Some may ultimately fail, leading to an increased number of sovereign states in the international political system. In this process, inter-state warfare may become a major defining characteristic in the 21st century.

Let me try and elaborate on the thesis of a type of new war before I bring you to our context – the Indian context. All these have an impact on how we are going to move on with our force structures which could become a subsequent matter of debate.

Osama Bin Laden put across to Al Qaeda in 1999: "We seek to instigate the [Islamic] nations to get up and liberate their land". The attack on the World Trade Centre was successful, probably beyond the expectations of the perpetrators, in publicising the global Islamic idea. Al Jazeera also announced that regardless of Osama being killed or surviving, the awakening had begun. The second type of war which has been put forward by researchers and mentioned by me, is virtual war or spectator-sport war. The US has utilised it the most, using superior technology, primarily airborne technology and advanced information and communications technology. This is achieved by virtual simulation, media manipulation, global surveillance and networked warfare to deter and, if need be, destroy, the potential enemies. It draws on the just war and holy war doctrines (the first, when possible, and the second, when necessary). Also, for own population to be spectators, they do not participate in any meaningful way by risking their own lives or paying any additional taxes. This differs from what Clausewitz was writing in the 19th century – for him, the reason implied the legitimate interests of state, i.e. on behalf of the whole nation. The thought that private groups (non-state actors) would be acting in their own selfish interests, did not count because it was quite contrary to the thinking of enlightened people of those days.

Therefore, a comparison of wars of the past decades, mostly on the basis of the ways in which they were fought, their tactics or *modus operandi*, with the wars of today, wherein the actors involved have been heaped together

under the rubric of 'irregular', can, and has, often led to an obsessive concern for developing counter-measures, sometimes detrimental to comprehending the long-term drivers of a conflict, especially a low intensity one.

The operational concept of precision engagement will underline military tactics and strategy which highlights the centrality of air power.

Globalisation, along with technological advances and international communications, has added a new dimension to the paradigm of today's warfare. Two good examples are Al Qaeda's worldwide operations and the Mumbai terror attack, which place emphasis on the visibility of the deeds rather than the practical consequences.

The changing nature of warfare calls for more attention to the study of strategy. In spite of globalisation and technological advances, the terminology to describe modern wars covers a wide range of concepts and, sometimes, is overlapping. There is wide divergence of opinion.

In the light of the perspective which researchers have brought out, where does it leave India? There are three more factors worth examination.

FROM BATTLEFIELD TO BATTLESPACE

Civilians are usually absent from the battlefield either because the battle occurred in a relatively unpopulated area or they fled prior to its onset. This linearity has diminished severely. Now the civilians and civilian objectives are intermingled with military objectives. The valid targets which could not feasibly be struck in the past, now become vulnerable. The universe of strikeable targets multiplies and, therefore, also the potential of collateral damage and incidental injury while still achieving military objectives.

The operational concept of precision engagement will underline military tactics and strategy which highlights the centrality of air power. It will consist of several systems of systems that enable military forces to locate the objectives or targets, provide responsive command and control, generate the desired effect, assess the level of success, and retain flexibility to reengage with the precision required.

As far as non-traditional warfare is concerned, in the Indian context, it will certainly be from a weaker adversary who intends to cause damage by exploiting the vulnerabilities of a stronger enemy, in this case, India.

Two capabilities are key to achieving precision engagements: (a) information dominance, particularly surveillance and reconnaissance; (b) ability to apply just the right amount and kind of force to accomplish the objective. Information dominance implies transparency of an opponent's action and intentions, and concealment of own (integrated intelligence at all levels of warfare).

Mountains of information will be available to the decision-maker, to the extent of becoming unacceptable in the unprocessed form. New data processing systems using artificial intelligence are being developed to rapidly fuse, sort, evaluate and disseminate information in a user friendly form. Future wars will not only be smart but "brilliant". Inertial navigation technologies and guidance systems will permit weapons to regularly strike targets within centimetres of the desired point of impact. Therefore, in many military operations other than war, deadly force may become counter-productive.

PERCEPTION MANAGEMENT

Only if there is responsible media and press, can perception management improve the connectivity of the political intention with the citizens, which is necessary for governments to justify wars and maintain vote banks for the next election.

As far as non-traditional warfare is concerned, in the Indian context, it will certainly be from a weaker adversary who intends to cause damage by exploiting the vulnerabilities of a stronger enemy, in this case, India. When Pakistani extremists infiltrated Mumbai and crippled one of the largest cities in the world with less than 10 individuals, it was proof of how warfare and national security stand redefined. This incident of November 2008 proved the evolution and transformation which has taken place faster than we thought, occurring within less than a decade of Al Qaeda's attack on the World Trade Centre in New York. These infiltrators used small rubber craft equipped with light tools,

where smaller is better, even smarter and independent. Carrying supplies in simple backpacks, they exploited over the counter technologies to overwhelm their targets. Simple navigation using Google maps, communicating and also updating planners and other team members by cell phones they successfully conducted guerilla information operations, carrying out ad hoc psychological methods of confusing their adversaries by manipulating the local media. So much so, that despite available scattered intelligence, the chief of one service did not react despite the fact that his forces were deployed in the area the extremists transited through, stating it was "unactionable" intelligence, and got away with a reward. The terrorists followed all the principles of special operations, sending false reports on Twitter of their positions and the numbers wounded or killed, causing the public panic that even overwhelmed their opponents i.e. the police and the military. It was marked by simplicity, security, repetition, speed, purpose and surprise. Every guerilla force uses these principles around the world. Our Anglo-Saxon model does not go the whole hog into siege warfare or counter-insurgency and professes large scale warfare. Nations can no longer afford large scale war over land now given the current state of the economy, the debts and the crying need to spend money on projects for the well-being of citizens. In general, nations cannot hide their large military operations – it will be too expensive to train, equip, field, support and provide security to large forces. It is time for smart and precision weapons. With cyber warfare, infrastructures can be crippled within minutes not to mention nuclear, space-based, biological and chemical weapons.

CYBER WARFARE

No discussion is complete without the mention of cyber and nuclear warfare. Cyber war has encouraged every country to spy on other nations to disable weapon systems, power grids, communication networks, transportation chains and logistics which heavily depend on open domain networks. Many military sources of infrastructure are outsourced to civil backbones and there lies the catch. The US and Israel created a virus called STUXNET to slow down Iran's development of nuclear technology – the result is that now Iran is talking to the world under the pressure of sanctions. Another example is the creation of

The focus of technologically advanced countries has shifted to space which so far remains an untested medium for war.

the virus Flame Virus, which attacked and infected networks around the Middle East and has been used for espionage—it was successfully used on Iran for over two years. In 2009, Russia and China infiltrated the US power grid and left malicious software that could that could potentially harm the entire electricity distribution system. No one has issued any denial. It only shows how cyber has changed the nature of warfare. The source of attack cannot be determined. It is a cheaper method of disabling the economy and can paralyse the infrastructure of the fighting forces. The MI 6 hacked Al Qaeda's website and changed the recipe for explosives for a recipe for cupcakes! Though this type of potential has not peaked, it has changed the nature of warfare as it is accepted as the 5th dimension in which wars are being fought.

NUCLEAR WARFARE

This warfare emerged in the 20th century World War II. The use of nuclear weapons can, and will, annihilate a complete country if used. Hiroshima and Nagasaki killed 200,000 people; it has the potential of extinction of all life on earth. This weapon prevented any big conventional war later. But it gave birth to guerilla warfare and later non-state warfare or state-sponsored non-state warfare. The threat of its being used has not disappeared altogether despite mutually agreed destruction, and the Strategic Arms Limitation Treaty. There have been many proliferations, mostly with the tacit support of the existing nuclear powers. So much so, that some of the countries that obtained nuclear weapon technology through such proliferating, have passed it on to the non-state actors, which poses a serious threat to humanity, particularly in our region.

SPACE WAR

The focus of technologically advanced countries has shifted to space which so far remains an untested medium for war. In the recent past, the race for supremacy in space has intensified. The US is supreme when it comes

to space communication, monitoring and possibly weaponisation. There is some debate that possibly the US has developed capabilities of virtually monitoring and selectively destroying terrestrial targets with precisional accuracy and least or nil collateral or incidental damage. This could be one reason why the US is losing interest in land warfare and letting other regional powers assume leadership of regions. The closest challenge to US supremacy is from China, which is many years behind the US in space assets. The other powers that have the capability of challenging the US in due course are Russia, France and, later, India.

In addition to technological changes , there have been changes in tactics as well.

SPECIAL FORCES

In addition to technological changes , there have been changes in tactics as well. Due to the nuclear backdrop, wars are less likely between conventional armies; rather, they are fought through special forces. This calls for the need for small, elite units that can be deployed everywhere, or special forces. Operation Entebbe, carried out by the Israeli Special Forces in 1976 was one such case. In 1976, terrorists hijacked an Air France flight and flew it to Uganda, where they released the hostages, except the Israeli ones, and threatened to kill them if Israel did not comply. The Israeli Special Forces planned and executed a rescue operation. They took all seven terrorist out, one Israeli commander was killed, and four hostages lost their lives but 104 people were rescued. Eleven Ugandan MiG-17s were destroyed on the ground and 45 of their soldiers killed. Conventional armies don't fare well in handling such situations. More and more confrontations have needed special forces' action rather than conventional armies' confrontation over land.

Special forces operations have been failures as well. Operation Eagle Claw failed, resulting in the deaths of 8 US personnel. It resulted from inadequate training. They did not adapt to the changed nature of warfare. It was inspired by the Entebbe Operation, but Eagle was too complex to be properly executed. In this case, a conventional war would have been all that was needed.

Our strategy for a two-front war does articulate dissuasive deterrence on one front and supremacy of capability on another.

INDIAN SCENARIO

Closer home, our scenario is more complex. Unlike the US, India is not a global power yet. Every external or non-state war is likely to result in internal damage to life and property, apart from loss of territory. These have to be protected. Our strategy for a two-front war does articulate dissuasive deterrence on one front and supremacy of capability on another. What needs to be factored in now is capability to protect maritime trade, supremacy to prevent any aggressor using sea routes (and sub-surface / air space above these seas) to harm our economic and terrestrial interest. Also, India being a big economy and principled democracy, it must ensure that the passage of commons is not impeded which will impact the world economy and, therefore, the well-being of citizens.

We are a nation of 1.2 billion and adding. Our security establishments are pockets of excellence but not truly synergised. Any threat to people, property and territory needs to be tackled **as the nation's war and not as an armed forces war or internal security war.** The line between war and peace or transition from external to internal war is extremely blurred, which has been discussed in the "Changing Nature of Warfare." Therefore, the moment a threat in any domain i.e. land, sea, air, space, cyber, nuclear, etc is perceived, all the powers of the state must have a mechanism to repel it. Or else, the threat can quickly convert into a conflict which will impact the well-being of our citizens. The Mumbai terror attack, the Parliament attack and other skirmishes are examples. Frequent incursions on the Chinese border, the growing influence of China in the Indian Ocean and littorals, and the withdrawal of the US and International Security Assistance Force (ISAF) from Afghanistan in the unfolding rainbow scenario of Al Qaeda and Islamic State (IS) which has the potential of manifestation into all its seven forms (that is why rainbow), are the challenges which India has to meet with comprehensive national power. As we visualise in our paradigm, the many mediums of war which utilise the new models of warfare need to be deterred with appropriate capability building and if it spills into a threat we must have the capability to punish,

using our comprehensive national power. This is the kind of structure of synergy we have to create to convert or transit from deterrence capability to its operational conclusion. As the National Security Adviser (NSA) in his earlier articulations has said: "National debate on these issues is a necessary prerequisite for a united national response..... is either conspicuously absent or mired with political acrimony is unfortunate …". Ajit Doval has added … "The country needs a strategic mindset and a consensual long-term vision if it has to emerge as a major global player".

Prime Minister Modi , who has an absolute majority in the Lower House of Parliament, has pointed out the changing nature of war. Very clearly, he has articulated that future wars will be short, with known threats but invisible enemies. This sums up the future direction for strategists and planners in the government to put the desired format in place. The statement gives credence to non-state wars, cyber, Unmanned Aerial Vehicles (UAVs), nuclear and space mediums which are part of the nature of this war. Attempts are being, and will be, made to cripple the civilian infrastructure which also supports the security mechanism such as power grids, communication and telecom networks, economic activity life lines, including stock exchanges and the transportation and logistics frameworks of the country.

China and India, as countries with increasing populations, requiring more and more energy and life sustaining resources, are in fierce competition to change the transitional world of unipolarity and have brought sea routes for trade and energy movement and protection thereof to centrestage. This pressing need has also enabled the smaller littoral states to take advantage of their geo-political positioning which gives them the opportunity to exploit vulnerabilities arising out of long logistics chains. There are technologically advanced countries and strong economies e.g. Japan, Brazil, South Africa, Indonesia, etc that have an equally strong presence at sea whose participation makes the solutions even more complex, which India has to cope with. Our political will has to translate into mechanisms which need **transformation** of the entire security infrastructure, decision-making structures, Research and Development (R&D) organisations, industrial and manufacturing policies, diplomacy and awareness of people.

Our capability building and transformation of security structures must result in a mechanism of deterrence. Our organisational tribalism must convert to nationalism.

There are new alignments and misalignments of nations in our vicinity which will be adversarial to our vision. Our negotiational skills will need modification and compromises will have to be made in the coming times to prevent the risks of visible conventional military confrontation. India is surrounded in a dense nuclear environment which also restricts freedom and escalation of war. Therefore, our actions will need to be swift, decisive and precise to avoid collateral damage. This will call for 24x7 surveillance, fusion of all intelligence data in all domains of warfare and monitoring of developments in our region of interest. Any changes from status quo will need to be addressed at the appropriate level, using just the right tools such as cyber, space, electronics, special forces and precision of air power available with the appropriate arm of the nation.

Our capability building and transformation of security structures must result in a mechanism of deterrence. Our organisational tribalism must convert to nationalism. Only this will force the adversary to be influenced and modify his behaviour to one which meets our national interests. It will force him to factor the cost of escalating non-nuclear conventional conflict to full scale. Skirmishes will continue, possibly using the civilian population as a shield, thereby compounding the necessity of precision targeting to achieve just the objective which would be necessary to overcome the decision dilemma. As a country we have to put our heads together for synergised and synchronised response capabilities and mechanisms, using modern and indigenous technology where possible. This must be aimed at penetrating the vulnerability of the adversary and punishing the weaker adversary hard if he takes the non-state route to create conflict and loss. The time to match gun for gun, ship to ship, aircraft to aircraft with a stronger adversary and fighting individual armed forces war is probably over.

INDIAN AIR POWER: ITS IMPACT IN INDIA'S STRATEGIC NEIGHBOURHOOD

MANMOHAN BAHADUR

The other feature, which often goes unremarked, can have subtle but far-reaching effects in both policy and scholarship. This is, for want of a better term, the virtual nature of air power.

….Karl P Mueller[1]

PREAMBLE

Prime Minister Modi, while addressing people in Kargil in August 2014, said that Pakistan must desist from waging a proxy war against India. As expected, it drew a rebuttal from Islamabad to which the Indian Ministry of External Affairs (MEA) spokesman responded that vis-à-vis terrorism,"… our tool kit is not restricted." Analysts, predictably, looked askance at Indian air power remedies thanks to the overdose of TV visuals of Precision Guided Munitions (PGMs) being broadcast so very frequently. But does it translate to simply an air power issue?

To be sure, this is not a piece on the attributes of air power – they are a given and have been well publicised ever since man took to the skies. It is also not a sales pitch by a believer in the phenomenal capabilities of

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1. Karl P Mueller, *Air Power*, p. 7. Available at http://www.rand.org/content/dam/rand/pubs/reprints/2010/RAND_RP1412.pdf. Accessed September 4, 2014.

India has taken positive steps towards acquiring an attitude, based not on cultural factors, but on *realpolitik* security considerations.

air power. But it certainly *is* an expansion on their importance in India's outreach to befriend countries, spread goodwill and possibly expand its influence as well. It is a given in history, and Paul Kennedy has written about it in his magnum opus *The Rise and Fall of Great Powers*, that history is witness to the fact that as nations improve the lot of their people, they have to go offshore in search of raw materials and this venture brings them in conflict with each other. Aren't we seeing this now around India – China's so-called Malacca Dilemma, claims for oil in the South China Sea, oil in West Asia and the competing claims and counter-claims of the nations in that region? Opening up of the Arctic due to the melting of the ice cap has resulted in a rush to establish a foothold there to lay claim to its natural resources – actually the list is endless. This is where India is at present and with the induction of the MMRCA (Medium Multi-Role Combat Aircraft) being the most discussed topic in the media, it is only appropriate to take stock of the significance of air power for India in its strategic neighbourhood.

Before the strategic neighbourhood is talked about, it is worth remembering that there is an ongoing debate in India on whether the country has a strategic culture to start with. Arguments have been put forth for both proponents and each side has points to support its arguments but what is sure is that since independence, India has taken positive steps towards acquiring an attitude, based not on cultural factors, but on *realpolitik* security considerations.[2] It is a good change from what Brahma Chellany, the noted geo-strategist wrote, that historically, "India has always wanted to be a state that is liked, not a state that is respected internationally."[3] And the examples

2. C Uday Bhasker, "Concept Note" in NS Sisodia and C Uday Bhasker, eds., *Emerging India: Security and Foreign Policy Imperatives* (New Delhi: Promilla & Co Publishers, 2005), p. xvi. "And by all accounts, the May 1998 nuclear tests signaled that India's strategic culture was acquiring more definitive contours wherein the commitment to certain normative values has not negated the accommodation of realpolitik security compulsions."
3. Brahma Chellany, "Befriending Japan, Balancing China:Modi's Foreign Policy," *The Hindustan Times*, August 29, 2014, New Delhi, available at http://www.hindustantimes.com/comment/analysis/befriending-japan-balancing-china-modi-s-foreign-policy/article1-1257624.aspx. Accessed on September 30, 2014.

of India becoming hard-nosed are many as it hedges its outreach, friendships and engagements with China, the US and Russia. Considered along with the Central Asian Republics, Japan, forays for oil exploration in the seas bordering Vietnam, the voting pattern in the UN Human Rights Commission's vote on Sri Lanka in 2014 (where it voted in favour of Sri Lanka), and its abstention in the UN vote on Crimea, a pragmatic Indian foreign policy becomes apparent.

There is now a self-confident India as compared to the one earlier, which had to see if its actions would offend a power, as it was constrained by Cold War rivalry.

There is now a self-confident India as compared to the one earlier, which had to see if its actions would offend a power, as it was constrained by Cold War rivalry.[4] This is not the case any longer, and, hence, it can *ab initio* exercise power to its advantage. There is "Indo-optimism rather than Indo-pessimism" that existed in the Cold War days, as writer C Raja Mohan has put it.[5] India can now be at the controls of the airship that defines power equations in the region, or at least be an indispensable element of the equation.

The doyen of Indian strategic thought, the late K Subrahmanyam had once said," Today the world has changed and India has changed." And he added, "our thinking has to change." Nowhere is it more applicable than in the rigid adherence to Service loyalties amongst our Service personnel, while other militaries are doing all they can to get in jointness. It is good to be pro-one's own Service, but not at the expense of the joint good. Jointness demands that the Indian Navy be strengthened, for that's where India's future threats lie, both concerning security as well as trade and commerce. It is also clear that, at present and for the foreseeable future, one would mandatorily need boots on the ground to control territory. But what is also true is that air power has a pivotal, and may be primary, role in guarding India's national interests and projecting power in its strategic neighbourhood – and if it comes to a crunch, in war-fighting, both over land and on the high seas.

4. C Raja Mohan, "Rethinking India's Grand Strategy," in Sisodia and Bhasker, eds., n.2, p. 35.
5. Ibid., p. 38.

It is vital to define strategic neighbourhood, but to do that, an examination of the historic evolution of the word 'strategy' would be necessary as it will drive arguments to arrive at the definition.

INDIA'S STRATEGIC NEIGHBOURHOOD

It is vital to define strategic neighbourhood, but to do that, an examination of the historic evolution of the word 'strategy' would be necessary as it will drive arguments to arrive at the definition. If strategy is a process of problem solving, then it has existed since the start of time. The 'clan leader', or whoever was at the helm, would be thinking of ways to get food for his flock or how to save it from the rampages of other tribes and those wrought by nature. So, over time and many generations, the idea of strategy became a bank of information from which a leader could draw – and the strategist was the person who advised the leader on what was to be done. As Lawrence Freedman has put it in his book *Strategy: A History*, "Strategy became a commodity, a distinctive product concerning a complex situation."[6] So, when one conjoins the term 'strategic' with 'neighbourhood,' to one's proximate countries, one is talking of a certain minimum span of time to be taken into context while formulating a future course of action.

Is it only physical proximity that constitutes a strategic neighbourhood or are there other factors involved too? It would be naïve to think that a country like Australia has just New Zealand as its strategic neighbour and vice versa. A good definition of 'strategic neighbourhood' would be "a geographical area that is *vital* for a nation for *the conduct of affairs of the state*." This brings in two terms, each having a deep import: first, what constitutes 'vital'; and second, what are 'affairs of the state.' 'Vital' would be something, the absence of which would result in a shortfall in something meaningful and/or result in a meaningful loss; 'affairs of the state' encompass tasks that a duly authorised government is obliged to perform as part of its duty towards the well-being of its citizens. But would one like to consider whether, in these times of globalisation, can one actually define neighbourhood in the traditional sense? It's a cliché that the world is now

6. Lawrence Freedman, *Strategy: A History* (New York: Oxford University Press, 2013), p. 72.

a global village, which actually now extends into cyber and space, so where does one stop? Is there a concept of strategic consideration in these times of globalisation? For the record, the Indian Ministry of Defence (MoD) has done so in its annual reports year after year. In the 2002-03 annual report, it defined India's area of strategic interest as "…from the Persian Gulf in the west to the Straits of Malacca in the east and from the Central Asian Republics in the north to near the equator in the south.."[7] This has expanded over the years and the latest 2012-13 report, says that "India's size and strategic location….links its security environment with the extended neighbourhood, particularly with neighbouring countries and the regions of West, Central Asia, South-East Asia, East Asia and the Indian Ocean."[8]

It is well appreciated that the air power of a nation is not just its air force but comprises all aviation assets that the nation possesses. However, it is also true that almost everywhere, the air force is a predominant part of air power.

So, having seen the official position, this essay will examine the significance of air power for India in the context of its strategic neighbourhood in three segments. Firstly, what sort of influence would India like to have? Its stated national policy is that it does not covet any other nation's territory but it must be remembered that the powder has to be kept dry for all eventualities. Second, what does air power bring to the table, such that it has become the tool or weapon of first choice of the politician for deterrence, as a foreign policy instrument, for regional influence and for the internal security of the nation; this would also include the limitations of air power in India's context. Lastly a summation of the points discussed in this article.

But first a clarification would be in order. It is well appreciated that the air power of a nation is not just its air force but comprises all aviation assets that the nation possesses. However, it is also true that almost everywhere, the air force is a predominant part of air power. So, in this essay, the terms

7. Ministry of Defence, Government of India Annual Report 2002-03, p. 2, Available at http://mod.nic.in/writereaddata/MOD-English2003.pdf. Accessed July 30, 2014.
8. Ministry of Defence, Government of India Annual Report 2012-13, p. 2, Available at http://mod.gov.in/writereaddata/AR_2013/Eng/ch1.pdf. Accessed July 31, 2014.

The capability of air power to deliver such expectations is inherent in its characteristics. Thus, reach, mobility, flexibility and response, all enable a nation to convey its will in times of need.

Indian air power and Indian Air Force, or IAF, are used interchangeably.

SPAN OF INFLUENCE

Firstly, what sort of influence would India like to have? Peaceful coexistence is the bedrock of India's dealings with other nations. Keeping that as a foundation, what the French General, Le compte de Guibert said in the 18th century, needs to be remembered:

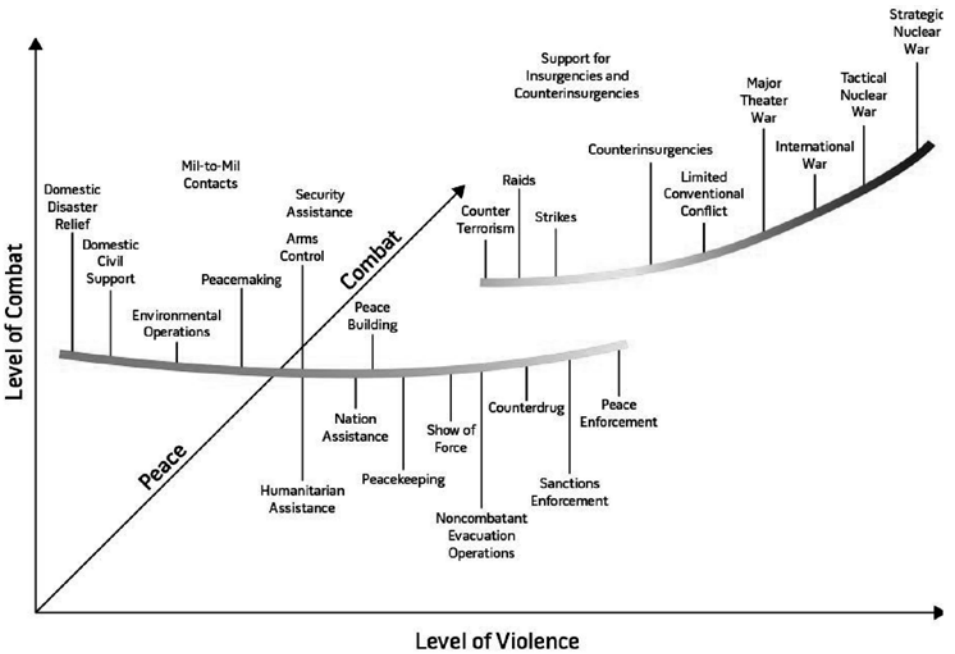
> To declaim against war….is to beat the air with vain sounds, for ambitious, unjust or powerful rulers will certainly not be restrained by such means. But what may result, and what must necessarily result, is to extinguish little by little the military spirit, to make the government less interested in this important branch of administration, and some day to deliver up one's own nation, softened and disarmed -- or, what amounts to the same thing, badly armed and not knowing how to use arms -- to the yoke of warlike nations which may be less civilized but which have more judgment and prudence.
>
> – Le comte de Guibert (1743-90).[9]

There is a deep meaning in what he said, and it is perhaps apt for many in India who question the wisdom of defence spending. In simple terms, it means that a nation should not be naïve and that it must maintain its capabilities and be ready to counter war-like situations. The route to enhancing capabilities is by harnessing technology. But, what is the effect of technology? "The essence of technology is not technological," wrote Christopher Coker, a professor of international relations at the London School of Economics, adding that technology "is one way by which we project our own power—the bow extends our range, the computer amplifies

9. Quoted by in Sisodia and Bhasker, eds., n.2, p. xiv.

our knowledge,"[10] basically emphasising that technology enables military power to fundamentally affect society in many ways. Air power is technology intensive and has become the weapon of choice of the politician due its many unique attributes, foremost amongst them being the capability to escalate and deescalate a situation quickly. With its capability to influence the environment, air power operates in almost the entire 'conflict' spectrum as shown in Fig 1.[11]

Fig. 1: Spectrum of Conflict[12]



The capability of air power to deliver such expectations is inherent in its characteristics. Thus, reach, mobility, flexibility and response, all enable a nation to convey its will in times of need. Its impermanence does not make

10. Christopher Coker, *The Future of War: The Re-enchantment of War in the Twenty-first Century* (Bodmin, Cornwall: Blackwell Publishing Ltd., 2004), p. 18.
11. http://ndupress.ndu.edu/Media/News/NewsArticleView/tabid/7849/Article/11242/jfq-75-determining-hostile-intent-in-cyberspace.aspx
12. http://ndupress.ndu.edu/Media/News/NewsArticleView/tabid/7849/Article/11242/jfq-75-determining-hostile-intent-in-cyberspace.aspx

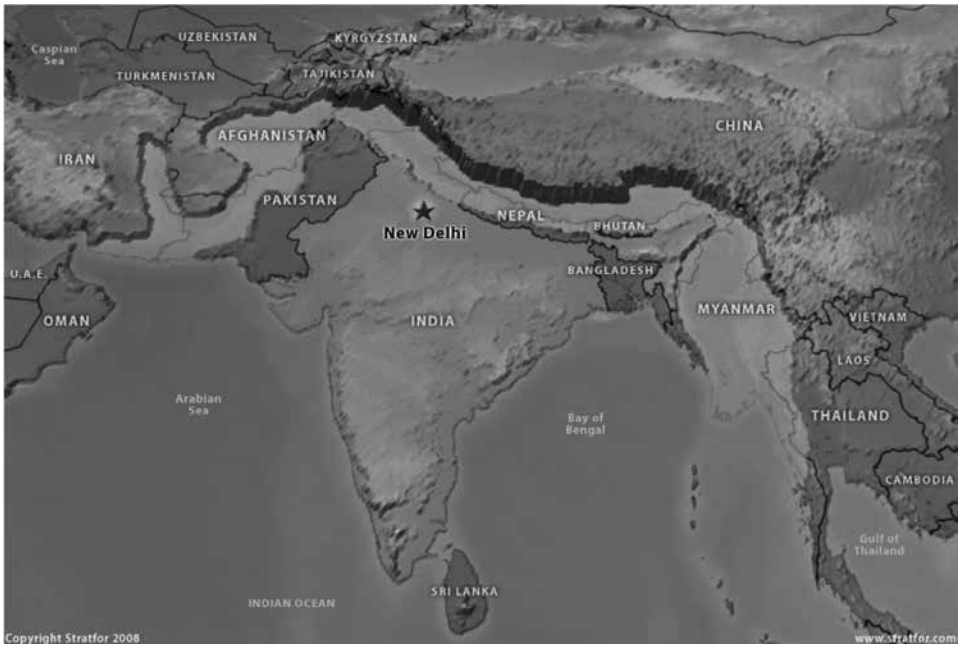
it look like an intrusive force and, scalability enables rapid ramping up or disengagement. What started as a contract by the US Army to the Wright Brothers in 1908, "..that it may be quickly and easily assembled and taken apart and packed for transportation in army wagons,"[13] has now grown to a capability that has multifarious avatars. So, the crux of what would be analysed is "what capabilities does Indian air power afford the political establishment in the discharge of its duties?"

EFFECT OF GEOGRAPHY

The politics of a nation is influenced a great deal by the effect of geography. It was more so in yesteryears where physical geographical features aided or acted as impediments to a nation's efforts to further its vital interests, but with technological advancements, the influence has been ameliorated to a certain extent. What had been the influence of geography on India's thinking and actions before the arrival of technological innovations in the 19th century? Historically, India has not been too outward looking a nation, when compared to some others. The Indian subcontinent can be considered to be an island as a whole.[14] This "island" is surrounded by the seas and oceans in the southern quadrant while to the west, it is isolated by mountains that rise from the Arabian Sea and run through Pakistan's Baluchistan province, stretching northward and rising higher to northwest Pakistan. There, the mountain chain slopes east, meeting up with the Pamir and Karakoram ranges. These finally become the Himalayas, which extend southeastwards to some 2,000 miles to Myanmar's Rakhine mountains and from there south to the Bay of Bengal.

13. B. D. Callander, "The Evolution of Air Mobility," (1998). Available at http://www.airforcemag.com/magazinearchive/pages/1998/february%201998/0298mobility.aspx
14. http://www.stratfor.com/sample/analysis/geopolitics-india-shifting-self-contained-world

Fig. 2: India as in Island[15]



Thus, the Indian subcontinent is surrounded by comparatively empty regions, and the catch word is 'comparatively,' with not enough resources to support a large population. Thus, there was no incentive as such for the Indian civilisation and thought to undertake a large scale expansion, beyond its cocooned landmass. Externally, down the ages, the threats to India have come from the passes along the Afghan-Pakistan border and from the sea; the Mughals came from the northwest while the British, French and the Portuguese sailed in from the seas. Given the isolation of the subcontinent, any further Indian expansion is limited to the naval sphere. A strong navy would be a barrier to any outside power that might attempt to penetrate the subcontinent from the sea. This could be a possible area of conflict as countries of the region go offshore to get resources and raw materials for their development. However, since the friction of terrain (both land and to a lesser extent, of water too) does not affect air power, it comes in handy to address the designs that some may have.

15. Ibid.

Earlier, as brought out above, the land around India did not support life and so there was no expansion**;** but today, is the same argument valid? There is oil and minerals in the Central Asian Republics. There is gas in Myanmar and its jungles are not that impenetrable. China has integrated the vastness of Tibet across our northern borders and our interests lie in the fact that the Sutlej, Indus and Brahmaputra originate in Tibet. In the south, the open vastness of the Indian Ocean beyond Sri Lanka beckons India due to geo-political reasons, with the busy Sea Lines of Communications (SLOCs) that pass through it. A tier further outward, in the west, there are the traditional sources of oil and a huge diaspora in the Gulf that is so important economically, not the least due large foreign exchange remittances ($23 billion of the $ 69 billion received in 2012). Africa beckons due to its natural resources and the fact that many countries there look up to India for a leadership role for the not so developed countries. Towards the east, the Association of Southeast Asian Nations (ASEAN) countries are of interest due to trade and as a counter to Chinese expansionism; there is a cultural pull too, and bilateral relations are flourishing with Vietnam, South Korea, Japan and other countries of the region.

So, with such a geographical environment, what can, or what does, air power do? It enables things to be done in an area from 'without,' with the intervening land and sea not being impediments. Dominance of the air is a given, the only point is that it has to be applied in the strategic environment and when it comes to disaster situations or war, tactically.[16] It gives the politician the ability to *implement* his ideas, to put his thoughts in action, at a place far removed in space and without serious constraint of time. This distillate will help evaluate what role air power would play for the commander – and the politician is *the* commander in democratic India.

HISTORICAL USE OF AIR POWER BY INDIA

It would be good if one goes back in time and starts with the invaluable role of Indian air power in the consolidation of the Indian nation and work up from there, as it will lead us to what it will do in the future. At birth, the political boundaries were drawn by Lord Radcliffe, leading to problems that still beg

16. Jasjit Singh, "Aerospace Challenges for India" in Sisodia and Bhasker, eds., n.2, p. 91.

a solution. India's strategic neighbourhood stopped at its borders. Had it not been for the airlift of troops by the fledgling IAF to Srinagar on October 27, 1947, the map of India would have been different, as would have been the history of the subcontinent. Then again, the landing on May 24, 1948, by Air Cmde Mehar Singh at Leh opened the Ladakh Valley to the Indian Army while the siege of Poonch was broken by a year-long air bridge established through a small airstrip due to some dare-devil flying by young transport pilots flying Dakotas.[17] On the other hand, inadequate or rather, non-availability of airlift capability proved to be the undoing of the siege of Skardu which could not be held and fell to the Pakistani raiders on August 14, 1948, after the defenders led by Lt Col JS Thapa had held on for six long months.[18] That's where some people doubt whether we have a strategic culture. In fact, in a seminar held at the Centre for Air Power Studies, a very renowned ex-foreign secretary said that if India had the strategic sense to think ahead, we should have continued with the gains in Jammu and Kashmir (J&K) and recovered the complete territory instead of going to the United Nations – can you imagine, he said, that "we would then have had a direct access to Afghanistan and the Central Asian Republics (then USSR), and had Pakistan in a pincer!" What the foreign secretary said is true, but those were chaotic days with means of communication being very poor and the counter argument to his persuasion was that strategic culture is nothing but a 'thought' generated due to a stimulus, and that the body of thought goes way back, even before Kautilya's time. Coming back to the role of air power in the consolidation of the Indian Union, the northeast

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17. http://indianairforce.nic.in/show_page.php?pg_id=68.
18. Col Tej Kumar Tikoo, *1947-48 Indo-Pak War: Fall of Gilgit and Siege and Fall of Skardu* (New Delhi: Vivekananda International Foundation, July 2013). Read the amazing story of tenacity, grit and leadership at http://www.vifindia.org/sites/default/files/1947-48-indo-pak-war-fall-of-gilgit-and-siege-and-fall-of-skardu.pdf. Accessed August 18, 2014.

The US military has a global presence due its airlift capability, and sea power too, for sure. The Chinese have realised the importance of air power after the 1991 Gulf War and are assiduously moving towards modernisation of their air assets.

of the country has been a daunting challenge due its unexplored territory and since 1947 to the present day, Indian air power has been carrying out air maintenance and supplying the civil population with rations in its task of consolidation of India's borders by assimilating the outlying population – a very costly way of doing so, but nonetheless, an imperative task. These are all India-centric examples, so during those early years, was Indian air power just inward looking? Far from it (as will be covered later) because as Indian foreign policy started spreading its wings, air power was on the front line doing what it was asked to do.

FOREIGN POLICY

The Clausewitzian dictum that "war is a continuation of policy by other means" can be put into effect by a state only if it has the military means to back its decisions. So, foreign policy steps taken to safeguard national interest require that the state has military muscle to exercise its will – it is a different matter that it may or may not be employed. Geo-economics is an important component of foreign policy and colonial empires were established on the basis of military power. The US military has a global presence due its airlift capability, and sea power too, for sure. The Chinese have realised the importance of air power after the 1991 Gulf War and are assiduously moving towards modernisation of their air assets; this is indicated by the growing number of People's Liberation Army, Air Force (PLAAF) officers occupying higher positions in their top military body, the Central Military Commission.[19]

19. Oriana Skylar Mastro and Michael S. Chase, "China's Air Force: Ready for Take Off?" *The Diplomat*, available at http://thediplomat.com/2012/11/chinas-air-force-ready-for-take-off/. Acessed January 17, 2015 and US DoD, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2014*, available at http://www.defense.gov/pubs/2014_DoD_China_Report.pdf. Accessed on January 17, 2015.

Indian air power, with its latest assets, now has the capability to give Indian foreign policy a diplomatic forward posture by its reach, much beyond its borders. How would it achieve that? Just as the economic strength of a nation has influence over a government's foreign policy so does military power have a 'long distance' influence over others. As Lawrence Freedman has written, "Strategy is about getting more out of a situation than the starting balance of power would suggest." After all, what is China doing now? Its military modernisation programme has cast an intangible influence on its neighbours, forcing them to take counter steps. Though it is downsizing and modernising its army, it is the modernisation of its navy and the air force that is bothering its neighbours more than anything else. Coupled with the enhanced capability of its second artillery in terms of range and accuracy, one gets an idea of the 'virtual' forward presence being exercised on its adversaries**;** the development of its anti-ship ballistic missile, the DF21D for its A2/AD (Air Defence) strategy to counter American sea power has exercised the US military fraternity and made it come up with its Air-Sea Battle (ASB) concept. China does not find a mention in the ASB document by name but the 'forward posture' due to the capability of the DF 21D runs as a thread in the ASB concept. In India's case, the capability of intervention in a foreign land to further its diplomatic interests by helping a friendly regime in trouble was clearly demonstrated in 1988 when elements of the 50 (I) Para Brigade were airlifted by Il-76s from Agra to Male in the Maldives and the coup against President Gayoom thwarted. Going back earlier to 1971, when the Janatha Vimukthi Peramuna (JVP) insurrection threatened the stability of the then Ceylonese government, the Indian government deployed six Alouette III helicopters and some fighter pilots to Ceylon – the former for the airlift task and the latter to train pilots for firing from the Jet Provost aircraft that the Royal Ceylonese Air Force had. Retracing a further decade back, in 1960, on the request of the United Nations, the Indian government sent six Canberra B-57 bombers to the Congo for reconnaissance and armament tasks. India had just emerged from its bondage through a non-violent struggle and had an image of a champion of decolonisation and peace. The dispatch

of the Canberra bombers, and, indeed, Indian Army troops, was towards fulfillment of that larger political and foreign policy aim. Returning to the present, the reputed *India Today* magazine has reported that in 2010, the IAF was ready to go to the aid of the government in Bangladesh when there were reports of a threat to the life of the leadership there. In fact, this was just a continuation of the policy to aid friends as seen as early as in November 1950 when the king of Nepal was evacuated from Kathmandu by a Dakota of the IAF as a fallout of the Rana's revolt. After the revolt died down, the king was restored to the throne**;** in this act lies the genesis of the Indo-Nepal Treaty which was then concluded and has since guided relations between the two countries.[20]

A little earlier, the dispatch of Indian air power in Congo in 1960 has been mentioned. One must not forget that beginning 1993, when two anti-tank guided missiles equipped Alouettes were sent to Somalia, India has been a substantial air power contributor to the cause of international peace. Between 2003 and 2010, 17 Mi17s and 8 Mi-25/35s of the IAF were deployed in Congo and Sudan – no other country had given so many assets, including night capable attack helicopters. They were withdrawn in 2010 due to internal requirements but having now got its inventory back full strength, this writer feels that India can recommence its contribution. So, the IAF has been an important cog in the foreign policy machinery of the country, enabling the government of the day to meet international commitments, and safeguard India's interests by adopting a posture that has an element of deterrence.

DETERRENCE POSTURE

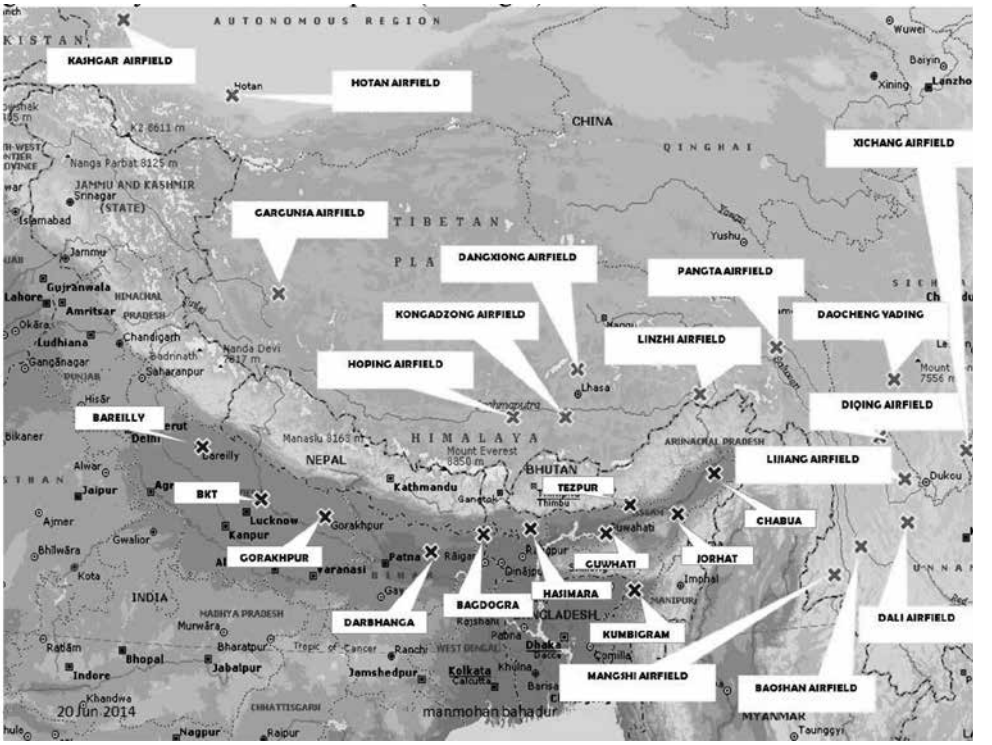
In the northern border with China, India has the disadvantage of terrain for its ground forces. As is well known, while it is a steep ascent from the Indian side to altitudes in excess of 17,000 ft in narrow valleys, the Chinese have the advantage of an easily negotiable flat terrain of the Tibet plateau. They have a good road network and now have the railway coming up to

20. Jasjit Singh, "Air Power in the Foreign Policy of Nations," in Jasjit Singh, ed., *Aerospace Power and India's Defence* (New Delhi: Knowledge World, 2007), p. 52.

Lhasa; in the next step, the rail connection is planned to be brought up to Bhutan and Nepal by the Chinese. So, the defence posture adopted by India is air power led because, as the late Air Cmde Jasjit Singh wrote, "Air forces are far more capable of generating strategic effect than the land forces. Modern air power does not have to fly over the well defended target or even close to it and yet destroy or at least neutralise it from beyond visual range. Technological capabilities have made long range precision strike a reality."[21] Our posture in the northern borders would be air power driven, with a *virtual* forward presence being created by positioning offensive air assets all along the string of airfields that are in the Himalayan foothills – here India has the advantage of all airfields being at extremely low altitude, enabling superior performance and load carrying capability for the IAF as compared to the Chinese whose airfields are at altitudes around 12,000 to 14,000 ft that entail severely degraded performance. If one sees the location of the Indian airfields, one finds that they are all mutually self-supportive unlike the Chinese ones, as the *inter-se* distances show. So, the conventional deterrent for China is Indian air power, and India has positioned Sukhoi-30s all along to convey such a resolve. Panagarh is being developed as a major transport base, with the six new Flight Refuelling Aircraft (FRA) being based there as well as the six new C-130Js that would come in a few years time. It is worth remembering that the new mountain strike corps of the army would also be based at Panagarh. So, with new helicopter units being based at Bagdogra, Barrackpore and Kumbhigram, the new Chinook heavy lift unit coming up at Dinjan and the existing two transport aircraft squadrons at Jorhat, the picture of a crouching IAF ready to uncoil is complete (see Fig 3).

21. Jasjit Singh, "Poised for Precision," *FORCE*, February 2011, p. 24.

Fig. 3[22]



War may or may not take place, but the impression of a forward posture of Indian air power makes a psychological deterrent impact in the neighbourhood. The positioning of air power assets to take up the challenge and convey its intentions of carrying the battle across the border indicates the posture that the country is willing to adopt. The landing on Daulat Beg Oldie by a C-130 and development of Nyoma as an airfield to take on fighter aircraft conveys intent.[23]

Here it would be appropriate to quote an example from the past to convey the point, and the shooting down of the Atlantique of the Pakistan Navy in Kutch on August 10, 1999, comes to mind. The incursion was not

22. Figure courtesy Gp Capt RS Chatwal of Centre for Air Power Studies, New Delhi 110010.
23. "IAF Planning Fighter Plane Base in Nyoma in Ladakh: NAK Browne." Available at http://articles.economictimes.indiatimes.com/2013-10-04/news/42718282_1_nyoma-nak-browne-advanced-landing-ground. Accessed January 17, 2015.

a one-off affair and was happening quite frequently till one day it was taken on by a MiG 21. From then on, the incursions stopped. The routine interceptions of civil airliners that deviate from instructions given by Air Traffic Control (ATC) also convey a message about the seriousness with which a nation takes an air violation. A perverse example is the shooting down of the Malaysian MH17, after which all aviation has started avoiding that air space. A similar thing happened in the Kamachatka Peninsula with the Korean Flight 007, which was brought down by the Soviets on September 1, 1983. In life, some people just don't learn and take a wrong view of overtures of peace and display of restraint. 'Kargil' had happened in mid-1999 and some may know that another mini one was attempted north of the Srinagar Valley in July 2002. While India's activation under Op Parakram was ongoing, Pakistani intruders had occupied Point 3260 in the Machil-Neelam-Gurez sector. An uphill attack by the army would have caused a large number of casualties. The IAF was called in and two well directed Laser Guided Bombs (LGBs) from a pair of Mirage 2000s knocked them off.[24] Subsequent radio intercepts showed that they had not expected the Indian establishment to go kinetic and utilise the IAF.[25] In the event, the message got across nice and clear.

INDIAN AIR POWER IN HADR

But is it just offensive or kinetic action that conveys the forward posture? Far from it, as the inherent capability of Indian air power to come to the rescue and help of its own nationals and those of its friendly countries is something that can be banked upon. Thus, in the super cyclone that struck Bangladesh in July 1991, the IAF was pressed into action at the request of the Bangladesh government. The tsunami of December 26, 2004, saw the IAF being cranked to the hilt: 30 transport aircraft and 16 helicopters flew round the clock to help the island territories and two IL78 aerial

24. Arjun Subramaniam, "From Kargil to Parakram: A Lesson in Forceful Persuasion," *The Hindu*, July 27, 2012. Available at http://www.thehindu.com/opinion/op-ed/from-kargil-to-parakram-a-lesson-in-forceful-persuasion/article3687855.ece Accessed January 17, 2015.
25. Incident narrated at the Centre for Air Power Studies on July 9, 2014, by Lt Gen Prakash Menon (Retd) military adviser to the National Security Adviser (NSA), Government of India.

The massive scale on which the IAF has mounted relief sorties within the country also conveys the resident capability and expertise that is available for the calling.

refuelling tankers were stripped of their fuselage fuel tanks overnight and the aircraft pressed into relief sorties in the cargo role. In addition, 6 Mi-8 helicopters were sent to help Sri Lanka in its relief effort. The Uttarakhand tragedy of 2013 had at any one given time, 54 helicopters of all types, of which 45 were from the IAF**;** it was perhaps the biggest helicopter evacuation in history, with 23,892 pilgrims brought out in a week's time.

The massive scale on which the IAF has mounted relief sorties within the country also conveys the resident capability and expertise that is available for the calling. When one talks of airlift, the example generally quoted is that of the Berlin airlift which has become synonymous with the resolve of society to fight for freedom. While its statistics are staggering, with the airlift of 2.3 million tonnes of load between June 26, 1948, and September 30, 1949 (one and a half years), a modern day airlift of similar proportions has not been heralded as much. Following Iraq's invasion of Kuwait in 1991, the Government of India decided to air evacuate Indian nationals from there via Amman. In what has found a mention in the *Guinness Book* for the most people evacuated by a civil airliner, Air India flew home 111,000 (at another place, the figure is 176,000) Indians in 488 flights from Amman to Mumbai, a distance of 4,118 km, in just two months between August 13, and October 11, 1991.[26] Translated to tonnage, it works out to almost 10 million tonnes, leaving the Berlin airlift way behind! It's true that the circumstances, the type of aircraft and the threat levels were vastly different, but it brings to fore the capability of the civil element of India's air power to come to the aid of its citizens. And what needs to be kept in perspective is that it was just Air India that was involved**;** the Indian civil airline fleet has grown manifold and in time of need, all the aircraft can be

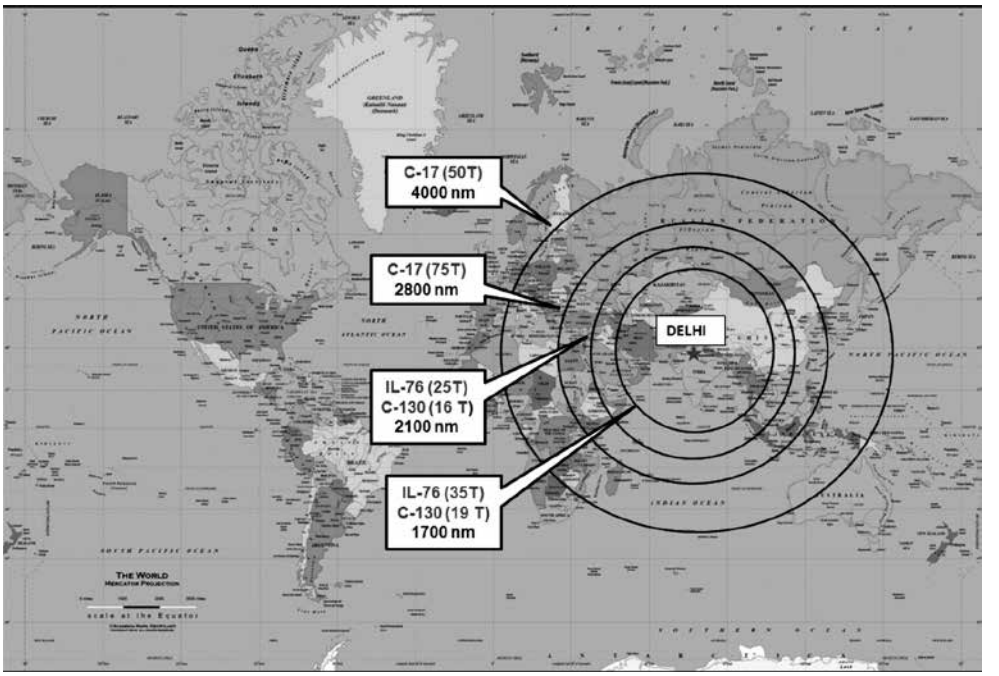
26. *Indian Foreign Affairs Journal*, vol. 7, no. 1, Available at http://www.associationdiplomats.org/publications/ifaj/Vol7/7.1/ORAL%20HISTORY.pdf and www.pib.nic.in/newsite/efeatures.aspx?relid=69345. Both accessed August 12, 2014.

requisitioned – we are seeing a miniscule view of this in the chartering of civil flights by the army to and from Leh and Thoise on a daily basis. The home secretary has the powers to requisition, literally commandeer, on an immediate basis any civil airliner to move police forces within the country. The IAF was on standby to move people out of Syria and earlier from Libya. In fact, one Il-76 was positioned in Alexandria during the Libyan crisis. In the case of moving of relief supplies to quake hit Kazakhstan, the IAF had its Il-76 in New Delhi hours before the supplies could fetch-up from the civil sources in Delhi. To move our casualties from Kabul in the various bomb blasts that have hit our installations, the IAF transport fleet was in the forefront; the only problem is the presence of Pakistan whose overflight clearance has to be obtained, taking up valuable time. The case of the hijacking of Indian Airlines' IC-814 to Kandahar in December 1999 and the release of jailed terrorists in lieu of passengers will always rankle our countrymen. But if it were to happen again, would we be able to do something different? The answer is YES, and this will be covered as the future is discussed below.

THE FUTURE

How will air power figure in the Indian scheme of safeguarding its national interests? Today, the IAF has new long range assets in its inventory. The transport fleet has the C-17 and C-130 while the Airbus 330 Multi-Role Tanker Transport will be inducted soon. Fig. 4 shows the unrefuelled radius of action of these aircraft, taking Delhi as the launch base. The C-17 will be able to put in between 50-70 tonnes and the C-130 around 16 to 20 tonnes.

Fig. 4



The Airbus 330 MRTT, when inducted, would transport 45 tonnes. And why forget the Il-76, which will continue to be in service for at least a decade plus; let's say, it can airlift 25-35 tonnes on an average. So, the Human Assistance and Disaster Relief (HADR) capability within these arcs is enormous and something that India can offer with remarkable ease. Actually, this writer is of the opinion that upfront, India can offer itself as a regional humanitarian aid provider, because, it must be remembered, the helicopter fleet with India is also substantial. Eighty Mi-17 V5s have already entered service and 59 more brand new ones are coming to replace the Mi-8s. Fifteen Chinooks will bring in heavy lift capability that is needed in any HADR situation. A C-17 can transport one Chinook so one can visualise the aid that can go into a disaster area really quickly. The National Disaster Relief Force, with its specialist equipment and personnel, has cut its teeth in many disaster areas, including at Fukushima and Uttarakhand – its combination with IAF airlift assets can bring succour to the needy once the government orders it. By doing so, India would have advanced its aim of

better relations with all and engendered a commitment among nations to come to each other's aid.

The airlift capability when combined with offensive assets, the Su-30 being the premier one, projects Indian power pretty far. The MMRCA, when operationalised, would also be in the scheme of things. Adequate signalling has already been done – some may know about the almost 10-hour non-stop strike mission by the Su-30s from Bhuj to Port Blair followed by weapons delivery at Trak Island in the island chain and return to Bhuj.[27] This signalled a message, that if in peace-time this is what is being practised, the missions in war would be even more far-reaching. A question had been posed earlier whether another Kandahar could have a different ending. Well, the assets are now available to avoid our western neighbour – the politician would get, in the author's view, an affirmative answer from the IAF when asked whether a rescue mission can be mounted, albeit a very challenging one – this is from a deployment point of view. But yes, it would depend on a whole lot of other employment of force issues as also political assurances that would have to be obtained, as Iran would have to play ball; but that's where the success of our diplomacy would be put to test. It may be recollected that Entebbe would not have been possible without fuel having been given to the Israeli aircraft by Kenya.[28] Kandahar is just quoted as an example, but the bigger issue is whether the country has the air power capability to take on such missions – and the answer is 'Yes'. The politicians would then have to decide, taking many other issues into consideration, diplomatic support/repercussions being a major one. The word is 'prudent' – would it be prudent to launch such a mission, for if it goes the Op Eagle Claw (the operation to free American hostages from Iran) way, there would be much more face to lose than what the Americans lost in Iran. But in such cases, risks have to be taken depending on the actualities

27. Air Chief Marshal NAK Browne, Chief of the Air Staff of Indian Air Force narrated this in a talk at the Institute of Defence Studies and Analyses, New Delhi, on September 23, 2013.
28. Lt Col Joshua Shani, the captain of the lead C-130 said in an interview that after landing at Entebbe, "…..we had a little problem: We needed fuel to fly back home. We came on a one-way ticket! We had planned for a number of options for refuelling, and I learned from the command-and-control aircraft flying above us that the option to refuel in Nairobi, Kenya, was open." Full interview of "Rescue at Entebbe," at http://www.idfblog.com/blog/2012/07/05/rescue-at-entebbe-an-interview-with-the-chief-pilot/#.U_Bxio6x0dV.twitter

on the ground and the expeditionary nature of the mission – the military's job is to have options ready for the political executive.

A decade from now, with naval carrier-borne air power fully operational around two Carrier-Borne Groups (CBGs), the semblance of an expeditionary capability would start taking shape. To be sure, that is not the stated position of the Government of India, but the axiom or truism that this essay started with was that "air power gives a forward posture to the power projection capability of a nation" and in the bargain, could influence the happenings in the neighbourhood**;** suffice to say that deterrence, compellence, coercion, dissuasion, persuasion *et al* get covered in the narrative. So, defence and diplomacy get a boost with air power in the vanguard.

But one aspect of 'neighbourhood' that is so intimately connected with anything worthwhile happening on land, sea and air nowadays has not been discussed till now. Shouldn't space also be considered a 'strategic neighbour' and one that has become so vital, for both military and non-military operations of everyday life? Air and space go together and must be included in the span of the definition of a nation's strategic neighbourhood.

Space is a military and economic centre of gravity, and, hence, it is a must to develop and safeguard our resources. There is a saying from the maritime and mercantilist era that the "flag follows trade."[29] So, Paul Kennedy's observation that was made at the beginning of this essay that history is witness to conflicts due to countries going offshore for economic interests, is equally valid for space. When it comes to space, it would *not* be theoretically wrong to say that all countries can be considered to be adversaries. The best of friends, even if located on the other side of the globe can, if the relations go awry, interfere with a nation's military and civil daily life – such has become the dependence on space. Without singling out China, one can say that it would be naïve to not expect our adversaries to make plans and develop means to interfere with, or harm, our assets. Avoiding, and if that's not possible, mitigating surprises would be the job of the Space Command which has been proposed

29. Bob Preston and John Baker, "Space Challenges" in Zalmay Khalilzad and Jeremy Shapiro, eds., *United States Air and Space Power in the 21st Century* (Santa Monica, CA: RAND, 2002), p. 172. Available at http://www.rand.org/content/dam/rand/pubs/monograph_reports/MR1314/MR1314.pdf. Accessed August, 18, 2014.

with the IAF as lead Service. This is one 'neighbourhood' that is work in progress and can be neglected only at the nation's peril. The formation of the Space Command had better happen sooner than later because it is one requirement which is as strategic as it gets.

At the strategic level, there is one serious limitation too of Indian air power; Indian air power lacks the bulwark of an indigenous industry to support its assets. That is a subject by itself and can be addressed in detail only through a separate paper. Suffice to say that India does not have the 'strategic depth' that comes from a home grown defence industry and many limitations flow out from there**;** focussed action to remove this millstone that imperils India's strategic autonomy is hopefully underway with a new government at the helm in Delhi.

SUMMATION

In conclusion, air power accords a forward posture to the policies of a government and the Indian state used the IAF to consolidate its boundaries during the five tumultuous years after gaining independence. Indian foreign policy has been supported by the nation's air power in guarding national interests and in coming to the aid of friends and neighbours. The latest acquisitions of transport aircraft and helicopters have given India a capability that can make it assume the role of a regional humanitarian aid provider and, when coupled with the potent offensive assets in its inventory, the outlines of an expeditionary capability start emerging. Space is a neighbour that needs to be given a strategic tag in order to get the attention it deserves. Indian air power has one big limitation, and that is the lack of an indigenous defence industry**;** it is a handicap that needs to be addressed quickly and would require sustained effort and focus from a dedicated team. And, finally, while one keeps talking of the requirement of bipartisan support for the political problems facing us, it is time for people in uniform and in the civil services to accord a capability it's due, rising above partisan and Service specific considerations. That's the only way India would be able to extract the maximum from the capabilities of its substantial and potent air power in furtherance of national aims and ambitions.

GENESIS AND EARLY GROWTH OF THE INDIAN AIRCRAFT INDUSTRY

VIVEK KAPUR

INTRODUCTION

Aircraft industries showcase the high technology capability of countries. Since its advent in the early 20th century, aviation has been a very high technology area of operation. Utilisation of aircraft in warfare has changed the manner in which wars are fought. Over time, military aviation has evolved to become the decisive instrument of the military power of a nation. Apart from military operations, aviation has become a major factor in delivering efficiencies to modern economies through increasing the effective utilisation of factors of production and other resources. Modern aviation equipment being of cutting edge design and incorporating very advanced technology, is quite expensive. Therefore, most advanced nations that have the wherewithal have invested in building robust domestic aviation industries. Apart from the cost of importing equipment, nations have found that despite the high cost, the imported aviation equipment often comes with political, economic, and strategic strings attached. Therefore, all nations that aspire towards great power status require putting in place an effective domestic aircraft industry. The world trade in aviation equipment is worth over several tens of billions of dollars annually. This gives further incentive to nations to commence export of aviation equipment apart from the geo-political advantages that this confers upon exporting states.

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Just as the invention of gunpowder led to the development of the armaments and firearms industry, the invention of flying machines led to the development of the aircraft industry, and as technology progressed further, to the aerospace industry.

BIRTH OF MODERN AVIATION

European efforts of research into the science of fluid dynamics by Otto Lilienthal, Sir George Cayley and Bernoulli amongst others led to the development of the science behind aviation. This science led the less scholarly but more technically and mechanically minded men to attempt to apply the then new theory into practice towards the development of mankind's first heavier than air flying machines capable of carrying human beings aloft this side of mythology. These efforts finally bore fruit with the Wright Brothers' flight of 12 seconds duration over 120 ft on December 17, 1903, at Kitty Hawk in Flyer 1, ushering in the modern aviation age.

The Great War in Europe forced the European countries to seize the lead in military aviation from the US. Many major advances were made by European military aviation due to the pressures of war. In contrast, in 1913, the US Army Air Corps (USAAC) had just six active pilots and the whole of the US had less than 170. However, not forced to divert resources towards war on the scale that the Europeans were, US *private entrepreneur companies* (emphasis added), led by Glen Hammond Curtis and James Smith McDonnell and Donald Wills Douglas (unrelated Scottish immigrant MIT graduates),[1] to name a few, established the US industry on its own feet, leading to several landmark achievements. One such achievement was the first trans-Atlantic flight by the US Navy flying boat NC4 and the first trans-global flight by the Douglas world cruisers[2]. Just as the invention of gunpowder led to the development of the armaments and firearms industry, the invention of flying machines led to the development of the aircraft industry, and as technology progressed further, to the aerospace industry.

1. Information from web page http://en.wikipedia.org/wiki/McDonnell_Douglas last accessed on March 3, 2014.
2. Air Mshl SR Deshpande, *Aerospace Industry* (New Delhi: Manas Publications, 2004), pp. 25-28.

IMPORTANCE OF AEROSPACE POWER.

Air power has some unique characteristics that have contributed to its coming to occupy a predominant position in a country's military capabilities.

From its initially humble beginnings in the early years of the 20th century, aviation technology has grown by leaps and bounds, and in modern warfare, it has come to occupy a central position in the armed forces of all major powers. Even the People's Republic of China's (PRC's) People's Liberation Army (PLA), that for years followed the people's war concept, based predominantly on massed land forces, with air power in a defensive and supporting role, has in view of the obvious primacy of aviation in modern military operations placed the PLA Air Force (PLAAF) at pole position in its modernisation efforts.[3] The PRC has also, in view of the acknowledged importance of air power to its Comprehensive National Power (CNP), invested heavily in its aircraft industry in both the military and civil sectors.[4] Air power has some unique characteristics that have contributed to its coming to occupy a predominant position in a country's military capabilities. Some important and unique characteristics of air power that make it so important to a country's overall national power are as follows:

- **Very Rapid Response:** Aircraft typically travel at speeds of several hundred kilometres per hour (kmph) as compared to, at best, a few tens of kmph for land and maritime vehicles, giving ability for rapid application of force, including insertion of troops and supporting material.
- **Ability to Circumvent Surface-Based Obstacles:** This capability comes from the very nature of aerial vehicles that are built to travel through the medium of the air and, hence, over and above surface obstacles—note the air bridge from India to China over the Himalayas (a formidable natural obstacle) maintained by the US Air Force (USAF) during World War II to supply the Nationalist Chinese forces fighting the Imperial Japanese and the Berlin airlift to supply and maintain the Western forces and population in West Berlin which city had at the time been besieged

3. KW Allen, G Krumel, JD Pollack "China's Air Force Enters the 21st Century" RAND Corporation Report from Project Air Force, 1995, pp. xvi-xxi.
4. Information from webpage article "ARJ21 Regional Jet Aircraft, China" at http://www.aerospace-technology.com/projects/arj21/. Accessed on March 5, 2014.

by the Communist Soviet Union's armed forces, circumventing a man-made obstacle in this latter instance at the end of World War II and the beginning of the Cold War.

- **Long Reach:** This capability obtains by virtue of the long operational radius of suitably designed aircraft which can be extended further through the use of air-to-air refuelling. Note the deployment of IAF Jaguar and Su-30 fighters to the continental US for exercises demonstrating the long reach of modern fighters that could deliver weapons to distant targets as well as deploy for specific peaceful purposes. Bombers and transport aircraft, the latter very similar to commercial airliners with which they share some technology, have consistently demonstrated their global range since the early years of air transport operations with useful payload. This long range large payload carrying capability has been increasing apace with advancements in aviation technology. The extreme example of this increase in large load carriage capability is the Soviet era An-124 "Ruslan" large transport aircraft which can carry up to 150 tonnes of payload over global ranges and is exceeded only by the Soviet An-225 "Mriya" which can carry a payload of a mind boggling 250 tonnes over global ranges[5].
- **Precision Strike Capability:** The precision strike capability of air power has been available since the early years of aviation. The difference today is that while in earlier, less technologically advanced years, precision strike capability dwelt in the pilot, this capability has progressively moved to be incorporated in the machine itself. In earlier times, the pilot's skill overcame the existing limitations of technology to achieve the required precision as in the case of air-to-air kills during World War I and World War II, including the precision strike capability of the Royal Air Force's (RAF's) 617 Squadron, the "dam busters" that specialised in precision attacks to destroy targets of great value (dams of importance to the Nazis) and the specialised target locating and marking for attack by other bombers by "pathfinder" units[6] within Nazi held territory in Europe in order to further the allied war effort till the late 1960s, with pilots using little more than ring and bead sights till more

5. Details of the aircraft available at webpage http://www.aviastar.org/air/russia/an-225.php. Last accessed on March 15, 2014.
6. "Dambursters", http://www.dambusters.org.uk/. Last accessed on March 17, 2014.

advanced sighting systems became available in the later decades of the 20th century. Precision ground attack with rudimentary sighting systems was also made possible with pilot skill overcoming the limitations of the existing technology in sighting and guidance systems. A shining example of a pilot incorporated precision ground attack is the IAF's No. 28 Squadron's, MiG-21FL's 57 mm unguided rocket precision attack on the governor's residence in Dacca during the 1971 Indo-Pak War; a shining example illustrating the truism that weapons are just weapons and they can achieve tactical or strategic results based on the skill of their timely application in time and space. Today, through mainly evolutionary, though at times, revolutionary, technology development and incorporation into modern weapon systems, precision attack capability has become more commonly available: this has been possible due to the development and widespread and ready availability of specialist weapons such as Laser Guided Bombs (LGBs) and Precision Guided Munitions (PGMs) like the Joint Direct Attack Munition (JDAMs) that use technical means of guidance like the Global Positioning System (GPS) making precision attack much easier to replicate on a large scale and apply where required. Operator training levels, while still important, are less so than was the case earlier and skills of assimilating new technology and techniques may today be more important than mental Dead Reckoning (DR) computing of weapon aim point lay-offs in the prevailing conditions to achieve the desired precision results.

Graded response capability derives from the ease of applying carefully graded force through carefully calibrated application of the desired or "just right"amount of force.

- **Graded Response Capability:** Graded response capability derives from the ease of applying carefully graded force through carefully calibrated application of the desired or "just right"amount of force. In the air power context, this graded application of force can be achieved through the choice of the number of aircraft in an attacking force and their weapons load up apart from the type of weapons selected (say a scale varying

Weapons are just weapons and are not tactical or strategic but the effects of their application are. The words tactical and strategic apply to effects and not to the weapons themselves.

from two aircraft each carrying one 250 kg LGBs as against six aircraft each carrying six 1,000 kg conventional iron bombs) and the relative ease of scaling up or down the applied force through the choice of throwweight and the choice of specific target systems to be attacked. Graded response capability, thus, depends upon the target selected for attack as well as the amount, calibre and precision of force applied against the selected target, the latter determining the amount of damage desired to be caused to the target of choice.

- **Inherent Strategic Effect:** The inherent strategic effect of air power, in contrast to the limited strategic effect of the surface forces, is evident from the fact that for an army to have strategic effect, it usually needs to defeat the opposing army in detail in the field and then threaten the enemy's heartland, while a naval force would require to totally interdict the enemy's lines of maritime communication or totally blockade his sea ports if the enemy is dependent upon maritime trade, while, in the case of air power, the inherent strategic effect of even tactical assets is most clearly brought out once again by the 57mm rocket attack by the IAF's MiG-21FLs on the governor's house in Dacca in December 1971. The clearly 'tactical' MiG-21 aircraft used, in conventional thinking terms, the "purely and obviously" tactical weapon, the 57mm hollow charge anti-armour rocket, to achieve an undisputedly strategic effect, the unconditional surrender of over 90,000 combat-worthy and 'undefeated in the field' enemy combatants, through timely and precise application of carefully graded firepower. This brings out quite clearly that weapons are just weapons and are not tactical or strategic but the effects of their application are. The words tactical and strategic apply to effects and not to the weapons themselves.

These unique characteristics of air power are unchallenged in the history of warfare and from an examination of these it flows that a nation that correctly utilises air power has the potential to achieve a decisive

advantage for military or political purposes. Note the Indian success in dislodging well dug in Pakistani troops during the 1999 Kargil War that defied the hitherto held conventional wisdom that in the mountains an advantage of 9 to 1 in favour of the attacker with well acclimatised troops would be required (though still with horrendous losses to the side aiming to dislodge well dug in opponents) to dislodge well dug in enemy troops in the mountains. In the Kargil War, the Indian Army did not enjoy a 9:1 advantage nor was there time to induct well acclimatised troops while recapturing the posts in the Kargil, Dras and Batalik hills from the enemy. While the Indian Army's losses were heavy, they were much lighter than they would have been if the IAF had not sustained a day and night aerial bombardment campaign against enemy troop positions and their logistics infrastructure. The US operations in the two Gulf Wars since 1991 in contrast to the innovative approach shown by the IAF in Kargil, brought out the unstoppable technology dominance that air power can bring to a modern battlefield.

The US operations in the two Gulf Wars since 1991 in contrast to the innovative approach shown by the IAF in Kargil, brought out the unstoppable technology dominance that air power can bring to a modern battlefield.

This is brought out most starkly by two watershed military operations in the past three decades. The first was the US led coalition forces' war against Iraq subsequent to Iraq's invasion of Kuwait, the Gulf War of 1991. In this war, a dedicated and sustained coalition forces air campaign against Iraq that commenced on January 17, 1991, called "Desert Storm", over 42 days, resulted in almost total absence of requirement for a land war. The land allied offensive, "Operation Desert Sabre" was able to wrap up its activities in just four days, commencing on February 24, 1991. President Bush declared a ceasefire on February 28, 1991, ending the Gulf War.[7] The coalition land forces were able to easily enter Iraq and penetrate till the capital and beyond, facing almost no opposition due to the near total destruction of the Iraqi armed forces by the preceding air campaign. Later,

7. "Persian Gulf War", http://www.history.com/topics/persian-gulf-war. Accessed on April 3, 2014.

in Kosovo the US led coalition forces, in Operation Allied Force, between March and June 1999, were able to achieve their war objectives against Serbian forces through the use of an air campaign alone.[8] These two examples bring out the overreaching importance of air power in modern warfare. The results and study of these relatively recent air campaigns led the Chinese political leadership to prioritise modernisation of its air force, the PLAAF over the modernisation of its naval forces and even more so over the land forces.

Disaster relief is a major area of secondary responsibility of the armed forces in general and the air force in particular. Disasters or natural calamities, such as floods, earthquakes, avalanches or fires require swift response, which is most effectively provided through military aviation. It need hardly be stated that natural calamities occur in India with uncanny regularity. Speedy transportation of rescue and recovery teams, medical aid, food supplies, relief material and evacuation of casualties are some of the activities for which military aviation is considered eminently suitable. However, it would neither be possible nor necessary to quantify the contribution of the IAF towards this national effort as such contribution cannot be provided so effectively and speedily by any other agency, nor can it be translated into monetary equivalence to be added to the Gross Domestic Product (GDP). The response to the cyclone on the Gujarat coast in June 1998, the earthquake in Gujarat on January 26, 2001, the tsunami of December 25, 2004, in the Indian Ocean, the earthquake in Jammu and Kashmir (J&K) on October 8, 2005, and more recently the devastating floods in Uttarkhand in 2013, are vivid examples of the contribution by the IAF in aid to civil authority during testing times for the nation.[9]

The economy also requires civil aviation for its efficient functioning. Civil aviation provides vital rapid logistics services for personnel and material to be moved to areas where these are required for efficient activities of a modern economy to take place on an ongoing basis. Today, it is difficult to imagine functioning without access to countrywide next day delivery

8. "Operation Allied Force", http://www.defense.gov/specials/kosovo/. Accessed on April 2, 2014.
9. Information from webpage http://www.indianairforce.nic.in/show_page.php?pg_id=115. Last accessed on March 18, 2014.

courier or post services and the ability to fly people to any part of the country or the world as required on very short notice.

Thus, it is seen that for many requirements which range from military needs, through efficient civil administration in difficult times to the economic imperative, a modern nation requires to have in place strong air power (comprising both the military and civil elements of the nation's aerial ability) capability. This fact, on being recognised, saw all the major powers of a century ago investing heavily in the development of a viable domestic aviation infrastructure and air power capability. India, as we have seen, entered the aviation field just a step or two behind the pioneering aviation nations close to a century ago. As we enter the new millennium, the old world order is changing, with new players emerging to replace the earlier great powers. The BRIC (Brazil, Russia, India, and China)[10] nations are most commonly talked about in respect of their being the expected major powers of the 21st century. It is pertinent to note that all these countries, with the exception of India, field well developed aircraft industries that are able to meet a sizeable part of their own domestic needs in addition to export of aircraft and related equipment. People reading this are no doubt familiar with famous aircraft manufacturers' names such as the Russian Aircraft Corporation (RAC) MiG, Sukhoi Corporation, Embraer, Shengyang Aircraft Corporation, Chengdu Aircraft Corporation, Aviation Industries of China (AVIC)-I and AVIC-II,[11] the last four being relatively new entrants in the domestically designed and built aircraft market from the PRC. While the various Russian aircraft manufacturers offer a full range of military and civil aircraft, including helicopters, the Brazilian company Embraer is progressively expanding its offerings to increase from civil use aircraft to include entry level military machines, such as the Tucano turboprop trainer and AMX light attack fighter, while the Chinese manufacturers are adding civil aircraft to their earlier military only product lines. India, in sharp contrast, has no globally competitive aircraft industry today. Over the years, the domestic Hindustan Aeronautics Limited (HAL) has produced a few moderately (though only

10. Jim O'Neill, Dominic Wilson, Roopa Purushothaman and Anna Stupnytska "How Solid are the BRICs?" Economic Research from the GS Institutional Portal at https://portal.gs.com. Accessed on March 18, 2014.
11. KW Allen, G Krumel, JD Pollack "China's Air Force Enters the 21st Century," RAND Corporation Report from Project Air Force, 1995, pp. 135-160.

India first entered the field of aviation through the pioneering efforts of an adventurous group of young men who took up flying as a sporting activity.

domestically) successful light propeller propelled trainers such as the Hindustan Trainer (HT)-2, Krishak and Hindustan Piston Trainer (HPT)-32 and one light jet basic trainer, the Hindustan Jet Trainer (HJT)-16 "Kiran" all of which were able to find a market within India alone. Of late, HAL has progressed the development of the Advanced Light Helicopter (ALH) "Dhruv" and is also developing the Light Combat Aircraft (LCA) "Tejas" and the HJT-36 Intermediate Jet Trainer (IJT) "Sitara" all of which are in different late phases of their development and operationalisation process.

INDIA'S ENTRY INTO THE AVIATION FIELD

India first entered the field of aviation through the pioneering efforts of an adventurous group of young men who took up flying as a sporting activity. This was in the opening years of the 20th century when modern aviation was just making its first beginnings in the US and Europe. Even before the IAF itself was formed, there were Indians who were pioneers in military aviation. Three of these early Indian military aviators were Sardar H.S. Malik, Lt Indra Lal Roy, Distinguished Flying Cross (DFC) and Lt S.G. Welingkar, Military Cross (MC) who served with distinction in the Royal Flying Corps (RFC) during World War I. A military flying school was set up by the British colonial government in India at Sitapur in Uttar Pradesh in December 1913. Civil flying clubs were set up in the metropolitan cities of India at Delhi, Bombay, Calcutta and Lucknow in the late 1920s. These civil flying clubs allowed adventurous young men to learn flying as a sport. Many of them later joined the volunteer reserve and subsequently several accepted absorption into the air force once it was formed.

Military Aviation in India

With the growth of the Indian nationalist movement in the early years of the 20th century, the demand for Indianisation of the armed forces in India gained ground. A committee was formed in 1925 under the chairmanship

of the Chief of General Staff, Lt Gen Sir Andrew Skeene, KCB, KCIE, CMG, to study the proposal. Regarding the air force, the committee recommended that selected, deserving Indians should be given the King's Commission to form an air arm of the Indian Army and be sent to the Royal Air Force (RAF) training college at Cranwell. The Indian Air Force Act became effective from October 8, 1932. Six young Indian cadets (Subroto Mukherjee, H.C. Sirkar, A.B. Awan, Bhupendra Singh, Amarjeet Singh and J.N. Tandon were sent to England in 1930 for two years' training. The first five qualified as pilots and J.N. Tandon as an equipment officer. Twenty-nine men were recruited from railway workshops and trained for a year as "apprentice aircraft hand". Of these 29 men, 22 qualified and were later called "hawai sepoys".[12]

With the growth of the Indian nationalist movement in the early years of the 20th century, the demand for Indianisation of the armed forces in India gained ground.

On April 1, 1933 'A' Flight of No.1 Squadron of the IAF was formed at Karachi with four Westland Wapiti aircraft.

The standard of the squadron's flying and serviceability of their aircraft earned the admiration of all concerned.[13] The squadron trained for, and took part in, operations against Frontier tribesmen along the western boundaries of British India. Calls by the Legislative Assembly for expansion of the IAF were opposed by the government, citing the high cost involved. The equipment of a single squadron cost Rs 80 lakh and its recurring expenditure was from Rs 20 to Rs 25 lakh.[14] The squadron began conversion to the Hart in June 1939. The conversion was completed in a few weeks without any problems. When World War II broke out, the IAF comprised a total of 16 officers and 144 men in one squadron with three flights.[15]

12. P C Lal, *My Years with the IAF* (Delhi: Lancer International,1986), pp.10, 11, 12, 13; and Polly Singh, *A Flight of Eagles The Westland Wapiti in the IAF Service,* http://www.bharat-rakshak.com/IAF/History/Aircraft/Wapiti.html. Accessed on March 18, 2014.
13. Lal, Ibid., pp. 12, 13.
14. S C Gupta, *History of the Indian Air Force 1933-1945* (Combined Inter-Services Historical Section India & Pakistan, 1961). p. 4.
15. "History of IAF", http://indianairforce.nic.in/show_page.php?pg_id=98. Accessed on March 18, 2014.

The outbreak of World War II saw calls for expansion of the IAF as it was feared that the RAF, in which responsibility for India's defence was vested, may be so involved in operations in other theatres that it may be unable to spare resources for India.

Civil Aviation in India

The birth and initial years of the growth of the IAF ran in parallel with pioneering activities in the civil aviation field in India. The formation of the civil flying clubs has already been mentioned earlier. It is pertinent to note here that the first commercial flight in India was made on February 18, 1911, when a French pilot, Monsignor Piguet, flew airmails from Allahabad to Naini, covering a distance of about 10 km in as many minutes.[16] The birth of Indian commercial aviation ran apace with the birth of the IAF and the first flight by an Indian on a commercial aviation task was fulfilled with the formation of the Tata Aviation Service in 1932.[17] The first flight of Indian civil aviation took off from Drigh Road airfield in Karachi on October 15, 1932, with Mr JRD Tata at the controls of a Puss Moth biplane that he flew solo to Ahmedabad and then on to Bombay[18]. Tata Aviation Service later became Tata Airlines and then Air-India and even later spread its wings abroad as Air-India International.

The outbreak of World War II saw calls for expansion of the IAF as it was feared that the RAF, in which responsibility for India's defence was vested, may be so involved in operations in other theatres that it may be unable to spare resources for India. Newly raised Coast Defence Flights (CDF) carried out long surveillance missions over coastal waters and, at times, escorted ship convoys through maritime trade lanes. Japan's entry into the war in 1941 accelerated calls for expansion of the IAF. The 1940 Plan 'A' for an effective air component of forces for the defence of India put the air requirements of India at 21 squadrons and 5 CDFs consisting of a total of 282 aircraft. The updated 1941 plan, taking into consideration deteriorating

16. Murali N. Krishnaswamy, "One Hundred Years of Flying High", http://www.thehindu.com/features/kids/one-hundred-years-of-flying-high/article2584818.ece. Accessed on March 20, 2014.
17. "JRD Tata : Sprit of the Skies", http://www.tata.in/article/inside/Pk4mYoO!$$$!iUY=/TLYVr3YPkMU=. Accessed on March 21, 2014.
18. Ibid.

relations with Japan, raised the requirements to 6 CDFs (57 aircraft) 21 squadrons (325 aircraft) and 2 CATUs (12 aircraft each). Against these, India had 5 CDFs of the IAF Volunteer Reserve (IAFVR), 2 RAF squadrons and 1 IAF squadron. By the time World War II ended, the IAF had expanded to 9 squadrons flying Hurricane, Spitfire, Vengeance and Dakota aircraft and had been blooded in battle in northeast India and in Burma.[19]

Growth of Support Infrastructure

This rapid growth of aviation in the country in the first half of the 20th century in both the military and civil fields required the putting in place of a suitable maintenance infrastructure; as all readers would be aware, the operation of any mechanical devices requires ready access to suitable repair and overhaul facilities as well as supply of spare parts, etc. As all the aircraft of the time were imported from Europe and there was no industrial base of any significance left in India, it was not considered feasible to set up manufacturing plants in India at the time. The IAF, due to its nature as a military force, with vital national defence tasks, required to have engineering skills adequate to keep its aircraft airworthy enough to execute their tasks. Hence, in the initial years, the hawai sepoys, were inducted and trained for maintenance tasks. As India was then a British colony, import of aircraft from the UK was considered acceptable, especially as independence from British rule was at the time still far from expectations in the then near future. In the initial years, the hawai sepoys, the 'ancestors' of today's airmen and officers of the Maintenance Branch, worked under the supervision and guidance of British airmen. At the end of March 1939, "for the first time, Indian SNCOs took charge of their trades and successfully discharged their duties. As the years passed, the IAF upgraded to better equipment than the Westland Wapiti with which the IAF was initially equipped, such as the Lysander aircraft followed by the Vultee Vengence and Hurricane and later the Spitfire. Indian airmen easily adapted to maintaining these newer aircraft and indeed such was their confidence that not only were they able to maintain these newer machines satisfactorily but they also applied their ingenuity towards modifications to the original designs aimed at improved reliability and usability such as the modification

19. "History of IAF", http://www.indianairforce.nic.in/. Accessed on March 22, 2014.

of the tail skid unit of the Lysander aircraft, modifications that were accepted by the Original Equipment Manufacturer (OEM) as feasible and valuable and were later implemented on the global fleet of these aircraft, leading to appreciable improvement on the entire global fleet of Lysander aircraft".[20]

INDIAN AVIATION SCENARIO TODAY

India today fields the world's fourth largest air force after the US, Russia and People's Republic of China.[21] India's civil aviation sector, after years of tight regulation, started to boom since the mid to late 1990s and despite some infrastructure and regulatory problems, remains poised for further growth in the coming years. In sharp contrast to other countries that host such large military and civil aviation sectors, India today remains primarily import dependent to meet its needs of aircraft and associated support equipment. This stands in stark contrast to the situation prevailing in the US, Russia, China and even in smaller countries such as France and Brazil where almost all design and manufacture of the bulk of their aircraft and related support equipment needs are met by domestic companies. This situation in other aviation countries stands in sharp contrast with India's primarily import based aviation sector, despite a robust civil engineering industry and an economy currently growing at the second highest rate in the world after the PRC, and leads to curiosity about the reasons for this import dependence, its long-term feasibility and the prospects and implications for the future of India as an aerospace power. Before proceeding further, it is relevant to understand the importance of a nation's air power for not just military security but also for the efficient functioning of the administration and economy.

Moreover, the present being but an edifice built upon the foundation of the past, in order to address the current and future state of the Indian aerospace industry, it is relevant to trace the historical path that has brought it to this stage and then to project the future prospects and to analyse possible methods and models that may be applicable in ensuring healthy growth of this industry in the future.

20. Gupta, n.14, pp 4-10.
21. Information from website http://www.scramble.nl/. Accessed on March 2, 2014.

NASCENT AIRCRAFT INDUSTRY WITHIN THE IAF AND IN THE CIVIL ARENA

The IAF efforts were only aimed at satisfactory maintenance of the equipment in IAF service with no pretensions towards setting up a nation-wide aircraft industry, though personnel who had served in the IAF formed a pool of trained aircraft savvy technicians who could be deployed in aircraft building projects post their IAF service if the need were to arise.

The genesis of an aerospace industry lies in the existence of domestic military and/or civil aircraft operators who require the products and support of, and, in turn, provide support to, a domestic aerospace industry.

The genesis of an aerospace industry lies in the existence of domestic military and/or civil aircraft operators who require the products and support of, and, in turn, provide support to, a domestic aerospace industry. Hence, the genesis of the Indian aerospace industry lies in the build-up of aviation activities within India in both the military and civil fields.

The concept, thought and initial action of establishing an aircraft industry in India came from a visionary individual, who saw the requirement eventually for indigenous aircraft design and building to support the rapidly growing military and civil aviation sector operators in India, and not the government. Seth Walchand Hirachand laid the foundations of the Indian aircraft industry at Bangalore in 1940. It all began with a visit by Seth Hirachand to the US for discussions with the Chrysler Corporation for setting up a car factory in India. On his flight back to India, he met and interacted with Mr Pawley who was then the director of the Harlow Aircraft Company. Seth Walchand was so enthused about aircraft manufacturing in India that during the flight itself he held detailed discussions with Mr Pawley and finalised a draft plan to set up an aircraft factory in India. Mr Pawley at the time was on his way to China to oversee the aircraft factories set up there for the Chinese Nationalist government in association with American aircraft manufacturer Curtis Wright. Seth Walchand was so keen on the project, and impatient to make a quick start, that he sent a detailed cable to the commander-in-chief India from the stopover at Manila itself. After his fifth cable, the commerce member of the government conveyed

Indian aviation owes an incalculable amount to the efforts of a single extraordinary man, Mr JRD Tata. Mr JRD Tata was the first Indian to get a pilot's licence in India in 1929.

that he would discuss the matter on his next visit to Bombay. This was in October 1939. After the full implications of the war in Europe became clear, the British government in London issued instructions that India should make its own arrangements for its defence, especially in the air. Around this time, Japan had opened the war front in the east. In this situation, the Viceroy of India Lord Linlithgow, finally took interest in Seth Walchand's project proposal and guaranteed support for him to set up an aircraft factory in India.[22] Thus, Seth Walchand Hirachand, a visionary private sector industrialist established India's first aircraft factory, Hindustan Aircraft Ltd, at Bangalore on December 23, 1940, with some support from the Mysore state government and work assurance from the Government of British India[23]. This formed the true genesis of the aircraft industry in India. Thus, this industry in India started in the private sector. Seth Walchand Hirachand was not the only noteworthy person who contributed to the growth of aviation, leading to the very need for a domestic aerospace industry. Another such notable individual was Mr JRD Tata.

Indian aviation owes an incalculable amount to the efforts of a single extraordinary man, Mr JRD Tata. Mr JRD Tata was the first Indian to get a pilot's licence in India in 1929. He later founded Tata Airlines, and remained closely involved with aviation in India as well as globally. In India, he made large contributions to the establishment of the required aviation infrastructure. Globally, he played a major role in the functioning of the International Air Transport Association (IATA) serving also as its chairman in 1958-59.

He did not venture into aircraft building, etc apart from setting up pure R&D organisations such as the Tata Institute of Fundamental Research (TIFR), and he did not foray into the aircraft industry *per se*, a decision that may have owed a lot to the political decision to reserve aircraft building for the government run public sector and deny the private sector any role

22. Deshpande, n.2, pp 60-65.
23. Ibid., p. 16.

in it in independent India till very recently. The Indian government's policies became clear even before independence when the Indian National Congress, in its 1946 session, adopted an industrial policy that reserved major and strategic industries, including aircraft building, as the exclusive preserve of the state.

HAL was established as Hindustan Aircraft in Bangalore in 1940 by Seth Walchand Hirachand with financial support from the Mysore state and assurance of work from the Indian government.

HAL FORMATION AND THE INITIAL YEARS TILL INDEPENDENCE

HAL was established as Hindustan Aircraft in Bangalore in 1940 by Seth Walchand Hirachand with financial support from the Mysore state and assurance of work from the Indian government. Hindustan Aircraft Limited was born on December 23, 1940, and began its historic journey as the flagship of the Indian aviation industry. HAL was registered as a private company with an authorised capital of Rs 4 crore. Production lines were established in collaboration with the Inter-Continental Aircraft Company of the USA for the manufacture of the Harlow trainer, Curtiss Hawk fighter and Vultee attack bomber. The initiative was actively encouraged by the Kingdom of Mysore, especially by its Diwan, Sir Mirza Ismail. The British government bought a one-third stake in the company by April 1941, as it believed this to be a strategic imperative. Later, in April 1942, it bought out the stakes of Walchand Hirachand himself and other promoters so that it could act freely. The decision by the United Kingdom was primarily motivated to boost British military hardware supplies in Asia to counter the increasing threat posed by Imperial Japan during World War II. However, the Mysore Kingdom refused to sell its stake in the company but yielded the management control over to the British government. Thus, within two years of its establishment, HAL was nationalised. There has, thus, been a government monopoly on aircraft manufacturing in India from almost the very beginning of this industry in this country. It bears pondering upon whether the nationalisation of this first private attempt at setting up aircraft manufacturing in India played a part in deterring other major industrial concerns such as the Birlas, Mahindras, Tatas and the like, from foraying into this area.

The first flight of a Harlow trainer was achieved by the newly established HAL in the record time of one year. This was followed a year later by India's first indigenous design and development effort, a ten-seat glider, the G-1, designed by Dr V M Ghatage, the first chief designer of HAL. The fact that this fledgling aircraft company featured a full-fledged design and development department is potent evidence of the progressive thinking of the forward looking visionary, Seth Walchand Hirachand, who conceived the idea of setting up this organisation with a view to ensuring India's rightful place amongst the club of aviation nations. However, to support the World War II allied war effort in the Asian theatre, aircraft manufacturing programmes at HAL were abandoned in favour of repair and overhaul and the company became the principle overhaul base for the Southeast Asia Command of the allied forces.

In 1943, the Bangalore factory was handed over to the United States Army Air Force while still using HAL management. The factory expanded rapidly and became the centre for major overhaul and repair of American aircraft and was known as the 84th Air Depot. The first aircraft to be overhauled at HAL was a PBY Catalina followed by every type of aircraft operated by the allied air forces in India and Burma. When it was returned to Indian control two years later, the factory had become one of the largest overhaul and repair organisations in the East. Repair and overhaul of many aircraft used in support of the allied war operations, such as the Fortress, Liberator and Mitchell bombers, Dakota and Commando transport aircraft and Catalina amphibians was undertaken. After the war, HAL undertook reconditioning and conversion of war surpluses such as the Tiger Moth trainers, Tempest fighters, Liberator bombers and Dakotas for the IAF and for Indian civil operators. In the interim, HAL also entered into a licence agreement to manufacture the Percival Prentice trainer aircraft for use by the IAF.

After India gained independence in 1947, the management of the company was passed on by the British government to the Government of India. Though HAL had not been actively involved in developing newer models of fighters, and other classes of aircraft, *ab initio*, it played a crucial role in the modernisation of the Indian Air Force over the years.

After India gained independence, HAL remained nationalised and the new Indian government, while formulating and articulating its industrial

policy, reserved aircraft manufacturing for the public (government owned and operated) sector of the economy, thus, establishing a monopoly for HAL in the field of aircraft building in India. Thus, the big Indian industrial houses such as the Tatas, Birlas, etc were forced to stay away from this field even if they had wanted to enter this industry and HAL remained the sole operator in the field of aircraft building in independent India. This monopoly led to all projects concerned with aircraft being given to HAL and this one company, thus, prospered with its order books overflowing with orders for the IAF and other players in the aviation field in India. After the licensed production of the Harlow trainer and Vultee Vengence dive bombers in the early to mid-1940s, HAL designed the HT-2 India's first powered aircraft designed and built within the country. The HT-2 saw extensive service with the IAF and a few were exported also, though with limited success.

Later on, HAL built the Vampire and Gnat fighters under licence, while at the same time, designing India's first indigenous jet trainer, the HJT-16, and India's first indigenous jet fighter, the HF-24 Marut, and went on to build the HS-748 transport aircraft and MiG-21 supersonic fighter under licence. Still later, HAL built India's first helicopters, the Cheetah and Chetak, under licence, designed and built indigenous light aircraft such as the Pushpak, Krishak, Basant, HPT-32 and later the LCA Tejas and ALH Dhruv. All through this period, licensed manufacture of cutting edge aircraft such as the Jaguar, MiG-21Bison and Su-30MKI continued. With these major projects, HAL emerged as one of the largest aviation companies in Asia, covering a large swath of products that included sub-systems and avionics to complete aircraft and even parts for spacecraft [built for the Indian Space Research Organisation (ISRO)]. Today, HAL has become a major player in the field of aircraft design and manufacture with its expertise recognised globally. It supplies parts to the aviation majors in Europe and the US apart from building a full range from sub-assemblies to complete aircraft for domestic customers. Its product range covers the full spectrum of aviation products. This journey has not been an easy one for HAL. HAL has required to absorb new technologies rapidly and strive to retain its aircraft design and development expertise despite a near total lack of funding to pursue purely R&D activities. Its fortunes have mainly depended upon the equipment requirements of the IAF, to meet which HAL has required

to bid at times against established international giants in the aviation field such as Boeing, British Aerospace, et al. HAL has also faced considerable, and at times quite unfair, criticism from the IAF and in the media for its inability to deliver equipment comparable to that offered by the likes of Boeing despite its sanctioned funding for such projects being a fraction of what international majors in the aviation field spend annually on just technology development, let alone aircraft design and development. For instance, the LCA Tejas programme is reported to have cost a total of US$ 2 billion while the global norm for such a project is generally over ten times as much. Of late, since 1991, the government has modified its industrial policy to allow the private sector to operate in the field of aircraft building and in defence related sectors. This change has seen several new operators enter this field and the increased focus of large Indian corporates should lead to greater competitiveness in the industry.

CONCLUSION

Aviation has made major advances since its introduction in the early 20th century. Today, a country's capability in aviation is a major factor in the determination of its military might. Aviation also plays a crucial role in making a country's economy efficient. Hence, aviation has become a major determinant of a country's overall power. India entered the aviation field in its infancy. Since the formation of the IAF and commercial aviation in India these services have expanded greatly. India's first aircraft manufacturing facility, HAL, was set up in the private sector in Bangalore in December 1940. Due to the exigencies of war, HAL was soon nationalised and converted to a repair and overhauling centre for allied aircraft. In 1947, control of HAL was handed over to the government of independent India. Since then, HAL has remained nationalised. Though Indian socialist industrial policies could have played a part in keeping the private sector out of aircraft manufacturing, HAL, over the years, has made several important contributions.

THE THREAT OF NUCLEAR TERRORISM

ARJUN SUBRAMANIAN P

In December 1998, in an interview to *Time Magazine* and ABC News, Osama Bin Laden said that the "acquisition of nuclear weapons in defence of Muslims is a religious duty."[1] Even before this, from 1992, Al Qaeda was trying to obtain nuclear material in the nuclear black market. In 1992, Osama bin Laden attempted to buy Highly Enriched Uranium (HEU) from South Africa. Al Qaeda's operatives were alleged to have negotiated with the Chechen rebels to buy a nuclear warhead, which the Chechen warlord Shamil Basayev claimed to have acquired from the Russian arsenal.[2] It is even believed that after Al Qaeda was expelled from Sudan, Ayman Zawahiri was travelling extensively to Russia, Yemen, Malaysia, Singapore and China trying to acquire Weapons of Mass Destruction (WMD).[3] The organisation has been involved in numerous deadly terror attacks around the world, including the 2001 World Trade Centre (WTC) attack. If the organisation ever manages to acquire a nuclear weapon or build one, it would not hesitate to use it. It is not just Al Qaeda and other Islamic terrorist organisations that might acquire nuclear weapons capability, any radical group, be it political

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1. "Osama bin Laden and Nuclear Weapons", http://www.johnstonsarchive.net/nuclear/osamanuk.html, September 22, 2002. Accessed on July 10, 2014.
2. Graham Allison, *Nuclear Terrorism Risks and Consequences of the Ultimate Disaster* (London: Constable & Robinson Ltd, 2006), p.3 (pp 1- 15)
3. "Osama Bin Laden Called the Use of Nuclear Weapons a 'Religious Duty'", http://nuclear-news.net/2010/11/21/osama-bin-laden-called-the-use-of-nuclear-weapons-a-religious-duty/. Accessed on July 20, 2014.

For an organisation with sufficient financial resources, a little technical assistance and access to the necessary amount of fissile materials, it would not be hard to build a bomb.

ultra right or left wing organisations, cults or other religious groups might try to acquire it and use it. One example would be the case of Aum Shinrikyo, a Japanese cult that combines tenets from Buddhism and Hinduism, and is obsessed with the apocalypse.[4] This small cult was involved in a deadly Sarin (chemical nerve agent) attack in the Tokyo subway in 1995 that killed 12 people and injured up to 6,000.[5] During the investigations that followed after the attack, it was discovered that the group had acquired a sheep farm in Australia where the land contained deposits of uranium and was trying to mine uranium and ship it back to Japan to build a nuclear bomb.[6] This shows how even a small group with limited resources could attempt to build a nuclear bomb.

For an organisation with sufficient financial resources, a little technical assistance and access to the necessary amount of fissile materials, it would not be hard to build a bomb. At the same time, it will not be very easy either. In the present scenario, organisations with the above mentioned resources could possibly build a simple gun type fission device. It is relatively easy to source other materials to build a gun type weapon, including the high explosives and the trigger mechanism. The hardest part lies in procuring the fissile core of the bomb. At least a couple of kilograms of HEU or weapon grade plutonium would be required for a single fission device.

Ever since the first explosion of the atomic bomb in 1945, the technology and the bomb have proliferated across the globe. Yet such proliferation so far remains constrained to state actors whose purpose is to use the bomb as a weapon for deterrence. But if nuclear weapons were to fall into the hands of terrorists, they would not hesitate to use them. There is no value for

4. "Aum Shinrikyo", http://www.cfr.org/japan/aum-shinrikyo/p9238, June 19, 2012. Accessed on July 21, 2014.
5. "Aum Supreme Truth (Aum) a.k.a Aum Shinrikyo", http://fas.org/irp/world/para/aum.htm, April 30, 2004. Accessed August 02, 2014.
6. Graham Allison, *Nuclear Terrorism: The Ultimate Preventable Catastrophe* (New York: Henry Holt & Company, 2004), p. 41.

deterrence for terrorist organisations; hence, they seek nuclear weapons with an intention to actually use them.

There are two ways for a terrorist organisation to acquire a nuclear device:

- Steal the bomb.
- Build the bomb.

Though nuclear weapons are in the control of the Pakistani government, events of the past few years have been causing concern on the possibility of terrorists gaining access to the weapons.

STEALING THE BOMB

Currently, nuclear weapons are possessed by nine countries, including Israel. State institutions are generally considered responsible actors when it comes to maintaining a nuclear deterrent force. Generally, a state considers its nuclear arsenal as a deterrent force and not as a war-fighting tool. Moreover, nuclear weapons are well guarded and not likely to fall into the hands of terrorists. Hence, the possibility of extremist elements getting hold of such weapons is very low. Thus, though there is indeed a low possibility of such an event, the main source of worry currently is Pakistan, a country with nuclear bombs which is not stable, and is a hub for terrorist organisations (with links to the military).

Though nuclear weapons are in the control of the Pakistani government, events of the past few years have been causing concern on the possibility of terrorists gaining access to the weapons. In 2012, the then US defence secretary and former chief of the Central Intelligence Agency (CIA) expressed concern about the danger of Pakistan's nuclear weapons falling into the hands of terrorists: "The great danger we've always feared is that if terrorism is not controlled in their country (Pakistan), then those nuclear weapons could fall into the wrong hands."[7]

There have been several instances when terrorists have struck facilities believed to house elements of Pakistan's nuclear arsenal. In 2007, terrorists attacked the military personnel stationed in the Sargodha Air Base which

7. "Pakistan's Nukes Might Fall into Hands of Terrorists: Panetta", http://timesofindia.indiatimes.com/world/pakistan/Pakistans-nukes-might-fall-into-hands-of-terrorists-Panetta/articleshow/15503071.cms, August 15, 2012. Accessed on August 02, 2014.

is alleged to be the headquarters of the Pakistan Air Force's Central Air Command and the home base for the nuclear-capable F-16 combat aircraft, and Hatf-III/Ghaznavi/M-11 ballistic missiles.[8] The evidence captured on US satellite imagery included missile crates; storage sheds for transporter-erector launch vehicles; missile maintenance facilities; and housing for missile crews.[9] In the same year, another air base, the Punjab- Kamra Air Force Base, believed to house nuclear weapons, was attacked by terrorists. Most significantly, terrorists blew up several entry points at one of the armament complexes at the Wah Cantonment, considered Pakistan's main nuclear weapons assembly facility. Again, in 2012, Taliban fighters mounted a daring attack on the heavily guarded nuclear air base in the Pakistan Aeronautical Complex at Kamra. The attackers breached the security perimeter, got past three security check-posts and were successful in damaging a Ukrainian built transport plane (Il-78) but were stopped before they reached the F-16s.[10] However, this attack was nowhere near the success scale of the PNS *Mehran* Naval Air Base attack in 2011.

The PNS *Mehran* attack stands as the most successful attack by Islamic terrorists on Pakistan military installations. Here too, the heavy security perimeter was breached and terrorists were able to destroy two US supplied P3C Orion maritime surveillance aircraft belonging to the Pakistan Navy which severely degraded its maritime surveillance capability. The significance of the attack lay in the ability of the terrorists to quickly breach defences around the base and find the quickest route to the high value military platforms in the base. This, as believed by many, could not have been possible without support from insiders i.e support from personnel within the Pakistani security establishment. This insider nexus remains central to the big concern about the possibility of nuclear weapons falling into the hands of terrorist organisations in Pakistan. It is believed that there are hardline, Islamic radical elements within the powerful Pakistani military, a legacy of the Zia-ul-Haq regime.

8. "Al Qaeda, Taliban Targeting Pakistani Nuclear Sites", http://www.longwarjournal.org/archives/2007/12/al_qaeda_taliban_tar.php, December 11, 2007. Accessed on August 4, 2014.
9. Ibid.
10. "Militants Attack Pakistan Nuclear Airbase", http://www.telegraph.co.uk/news/worldnews/asia/pakistan/9479041/Militants-attack-Pakistan-nuclear-air-base.html , August 16, 2012. accessed on August 6, 2014.

The state's intelligence agencies also have strong links with the terrorist organisations operating both within and outside the country.

Another reality is that most of the facilities which are believed to house the nuclear arsenal, including missiles, are located in the western region of Pakistan which is the hub for the most deadly terrorist organisations. Regions like the North-West Frontier Province (NWFP), now Paktunkhwa, are infested by tribal warlords and terrorist organisations. This region particularly is one where the writ of the government hardly runs. The reason for Pakistan locating its strategic assets in these dangerous areas is because of the India factor. Pakistan lacks strategic depth along the latitude, hence, it fears that in the event of a war with India, its nuclear facilities could be run over by Indian forces if located in the east and the weapons would fall into the hands of its adversary. This trade-off by Pakistan, coupled with the insider nexus has increased the risk of nuclear terrorism. In the future, if non-state extremist elements in the country were to get hold of nuclear weapons, it would be a threat not only to India but to the whole Western world, more particularly the United States of America. This risk would be further aggravated if Pakistan actually deploys tactical nuclear weapons which would be miniaturised warheads and the fuel would probably be plutonium from its nuclear reactors.

Apart from Pakistan, possible loose nukes of the Russian arsenal have been a serious concern ever since the break-up of the Soviet Union. "In 1997, Boris Yeltsin's assistant for national security affairs, General Alexander Lebed, acknowledged that 84 of some 132 special KGB 'suitcase' nuclear weapons were not accounted for in Russia. These weapons are miniature nuclear devices (0.1 to 1 kt), small enough to fit into a suitcase carried by a single individual. However, later he recanted his statement under pressure from colleagues."[11] There are other possible sources for fissile materials. North Korea is reported to be switching from plutonium fuelled bombs to HEU.[12] Given the economic condition of the Democratic People's Republic of Korea (DPRK), it could possibly sell fissile material to non-state organisations. North Korea already

11. Allison, n.2, p.10 (pp 1- 15).
12. "Study Sees North Korean Advances on Uranium Enrichment", http://online.wsj.com/articles/SB10001424052702304213904579093243783830288, September 23, 2013. Accessed on August 10, 2014.

The process is simple as well as difficult. Surprisingly, the simple part is assembling the bomb, but the hardest part is acquiring the fissile material, fabricating and machining it.

has a history of ballistic missile proliferation to Iran and Pakistan.

However, stealing a bomb is just one part of the job for a terrorist organisation—the difficult part lies in transporting the bomb to the target nation, which would be problematic without strong state support, which is unlikely to be given. Stealing a bomb from a state is most likely to be noticed by the government agencies, if there is no insider support, and this makes it much harder to transport it. Hence, this is a tough route for acquiring a nuclear weapon by non-state actors. For a non-state organisation, the probability of success in acquiring and using a nuclear weapon will be higher if the process does not raise an alarm and is done clandestinely, away from the prying eyes of governments across the world. So, building a bomb will attract relatively less attention, increasing the possibility of successfully acquiring the weapon.

BUILDING A BOMB

For a non-state organisation to build a bomb, it would take a lot of patience, a considerable amount of money, the right contacts in the nuclear black market to acquire the materials required to build a bomb, and sufficient technical knowledge to assemble the acquired material. The process is simple as well as difficult. Surprisingly, the simple part is assembling the bomb, but the hardest part is acquiring the fissile material, fabricating and machining it. To understand this, it is essential to have some basic knowledge of the bomb design. For this purpose, let us just look at the design of the fissile core.[13] There are two ways a nuclear fission core can be designed; one is a gun type design and the other is the implosion design. For example, the bomb dropped on Hiroshima was a gun type device while the one dropped on Nagasaki was an implosion weapon. For an implosion device, usually plutonium is preferred as the fuel as a smaller

13. Only the fission device is discussed here as a fusion device would be technologically be too complicated or close to impossible for terrorist organisations to acquire.

amount is required compared to HEU. The fissile core is surrounded by high explosives to create sufficient pressure to attain critical mass. In a gun type device, a section of the separated uranium core is fired along a barrel at high speeds to slam with the main uranium core for critical mass to be achieved for a sustained chain reaction.

From the design point of view, the gun type device would be the simpler design for a non-state organisation to build compared to an implosion device.

From the design point of view, the gun type device would be the simpler design for a non-state organisation to build compared to an implosion device. For a gun-type device, the preferred fuel is weapon grade HEU. From the nuclear threat angle, it should be noted that the existing stocks of weapon grade HEU the world over are larger than the stocks of plutonium. As per estimates, the total amount of global military stocks of plutonium was just 155 tonnes while the military grade HEU was 1,725 tonnes as of 2003.[14] However, the civil stocks of plutonium are far more than the civil stocks of HEU. But, it would require advanced industrial infrastructure to reprocess the spent fuel to extract weapon grade plutonium which is quite impossible for a non-state organisation. Normally, to build a simple unsophisticated single stage gun type fission device, the amount of weapon grade HEU required would be around 50-60 kg. For example, the atomic bomb "Little Boy" dropped over Hiroshima contained a core of roughly 60 kg of HEU enriched to about 80 percentage.[15]

For building a bomb, the organisation has to source the necessary materials. Among the materials, except for the fissile core, all the others are extremely easy to obtain without raising any suspicion, including the high explosive charge which a terrorist organisation is expected to have in abundance. The difficulty in sourcing the fissile material is the reason why the world has not yet faced a terrorist nuclear weapon attack. The bad news is that rogue regimes and extremist organisations with an intention to cause

14. "Global Stocks of Nuclear Explosive Materials: Summary Tables and Charts", http://isis-online.org/uploads/isis-reports/documents/summary_global_stocks.pdf, September 7, 2005, p.2.
15. "Appendix B: A Primer on Fissile Materials and Nuclear Weapon Design" http://www.pbs.org/wgbh/pages/frontline/shows/nukes/readings/appendixb.html. Accessed on August 14, 2014.

terror are in a constant search to obtain the material. But the worst news is that there is a black market where, with the right contacts, the material may be acquired.

Despite the possibilities for a non-state terrorist group to acquire HEU, the amount of HEU that may be obtained is a matter that should be looked into to understand what kind of weapon it could build. As mentioned earlier, an unsophisticated single stage fission bomb would require around 50-60 kg of weapon grade HEU. If terrorists are not able to collect such an amount, they would be forced to opt for an implosion design despite it being relatively complex to build compared to a gun type weapon, as the amount of fuel that would be required for the design would be less. Despite the complexity involved, it could be built with the knowledge that is readily available in the public domain. This would require some technical skill which can be obtained from any university around the world offering courses like in nuclear physics or else, the internet is a huge source of information for such an effort.

The amount of weapon grade HEU that would be required for building an implosion type single stage fission device would be as low as 6 to 8 kg for a low yield of one kilo tonne (kt).[16] The amount required could be further reduced by improving the design. Considering that terrorists are capable of making a much better design, they could reduce the required quantity of HEU to as low as 2.5 kg for a 1 kt weapon. For a 20 kt weapon, 5 kg of HEU would be required if the design sophistication is high.[17] The efficiency of the bomb and the amount required for a particular yield will depend on the level of compression achieved, the efficiency of the neutron reflector and the accuracy in timing the initiation of the neutron burst towards the fissile core. The better the efficiency of these factors, the lower the quantity of required fuel and the higher the yield for the available fuel.

Sub-critical compression can be achieved by providing the core with a thick tamper. The neutron reflector itself can be used to provide this tamper which would also increase the yield of the bomb. The strength of

16. Thomas B. Cochran and Christopher E. Paine, "The Amount of Plutonium and Highly Enriched Uranium Needed for Pure Fission Nuclear Weapons", *Natural Resources Defence Council Inc*, April 13, 1995, https://www.nrdc.org/nuclear/fissionw/fissionweapons.pdf , p.6.
17. Ibid., p.9.

the tamper would maintain the criticality of the core after the initiation of the fission reaction for a little longer before disassembly of the core as a result of the explosion. This would result in higher fuel burn up and higher yield. Though these design aspects may be a little complicated, the possibility of a non-state organisation achieving these cannot be completely ruled out. Hence, if a terrorist organisation manages to acquire even a few kilograms of weapon grade fissile material, probably HEU, then it would be just a question of when and where a nuclear strike could occur, provided the attackers have the organisational competence and manage to evade the government security agencies in the process.

Now, that the design aspect is clear, the next question is: will terrorist organisations be able to acquire sufficient fissile material to build a fission device? The answer is, 'Yes'.

The International Atomic Energy Agency (IAEA) believes that there may be around 2,000 tonnes of black market plutonium and highly enriched uranium scattered around 40 countries.[18] And there have been several instances of attempted selling of fissile materials. Over the last three decades, there have been around 1,700 such incidents.[19] Two cases where large amounts of fissile materials went missing were suspected to be state intelligence operations involving Israel. From 1957 to 1965, 100 kg of U-235 went missing from the nuclear scrap plant in Pennsylvania.[20] Recently, declassified US government documents from the 1970s revealed that the stolen uranium was likely taken for the clandestine Israeli nuclear programme. Again, in 1968, a ship sailing from Antwerp was used to transfer 200 tonnes of uranium which was also suspected to be for Israel's nuclear weapon programme.[21] These large quantity thefts are related to the involvement of a state which has considerable influence and resources. Other than these, the other cases are largely of thefts involving lesser

18. "Truck Full of Nuclear Waste Stolen in Mexico", http://www.slate.com/blogs/the_world_/2013/12/04/nuclear_materials_truck_stolen_in_mexico.html, December 4, 2013. Accessed on August 30, 2014.
19. Ibid.
20. "Fissile Material Theft Chronology", http://www.nuclearfiles.org/menu/key-issues/nuclear-weapons/issues/proliferation/chronology-fissile-material-theft.htm. Accessed on September 11, 2014.
21. Ibid.

Mostly, cases of theft of HEU in kilograms involved either personnel working at nuclear facilities or who belonged to the armed forces and had access to such materials.

amounts, from grams to a couple of kilograms of fissile materials.

Among several cases, some are of significance either because of the quantity or the nature of the people involved in the theft. In 1992, Leonid Smirnov, a foreman working at the Luch nuclear enrichment facility in Podolsk, started stealing minute amounts of HEU every day from the plant. The instruments in the plant had an error margin of +/- 3 percent, hence, the theft went unnoticed. In a span of four months, he was able to accumulate a little more than 1.5 kg of 90 percent enriched uranium. The theft went unnoticed and he was caught only by chance when he attempted to sell the uranium.[22] The very next year, two Russian naval officers were arrested outside a storage facility for the Russian North Fleet. They were found to possess 1.8 kg of HEU.[23] In the same year, three more Russian naval personnel were arrested for stealing 4.5 kg of HEU from a Russian naval base storage facility in Sevmorput.[24] Another case of December 31, 1994, also involved personnel who belonged to the Russian armed forces. They were in possession of 2.72 kg of HEU.

Numerous other cases that were reported involved only small amounts of fissile materials, mostly a few grams in weight. However, in July 2001, three men were caught trying to sell 1.7 kg HEU in Georgia. This is reported to be the largest confirmed case of weapon grade uranium theft. Mostly, cases of theft of HEU in kilograms involved either personnel working at nuclear facilities or who belonged to the armed forces and had access to such materials. In all the reported cases, the offenders were caught before they could sell it to potential buyers. These are the known cases but what remain unknown are of serious concern. In the words of former Central Intelligence Agency (CIA) Director John Deutch " It's not so much what

22. World at Risk: The Report of the Commission on the Prevention of WMD Proliferation and Terrorism, http://www.globalsecurity.org/wmd/library/report/2008/wmd-prolif-terror-commission1.htm. Accessed on September 15, 2014.
23. n.20.
24. Ibid.

I know that worries me, as what I know that I don't know."[25]

The only possible explanation in favour of the argument that so far no weapon grade fissile material has ever got into the hands of terrorists is the fact that no nuclear weapon attacks have been carried out by terrorists till date. However, from the number of incidents that are reported, it is highly likely that in the future, militant organisations may successfully acquire enough material to assemble a fission bomb.

One crude method to build a radiological device is to mix sufficient quantity of highly radioactive material with a high explosive charge and explode it. Such an explosion would disperse the radioactive content in its surroundings.

RADIOLOGICAL TERRORISM

Apart from nuclear weapons, terrorists could use radiological weapons to create terror on a massive scale. Compared to acquiring nuclear bombs, these weapons are relatively easier to build as all the materials can be acquired with relative ease. One crude method to build a radiological device is to mix sufficient quantity of highly radioactive material with a high explosive charge and explode it. Such an explosion would disperse the radioactive content in its surroundings. This type of weapon is what is called a "dirty bomb" or Radiological Dispersal Device (RDD).

To highlight the fact that terrorist organisations can acquire, build and transport such a device to their target area, the Chechen separatist plot to use RDD may be cited. This was the only terror plot that has involved an RDD. On November 23, 1995, Chechen separatists put together a crude bomb which contained a 70-pound mixture of dynamite and cesium-137 in Moscow's Ismailovsky Park. However, the rebels decided not to detonate the RDD and, instead, alerted the media.[26] This demonstration by a rebel group highlights the danger of an extremist group acquiring nuclear materials for building dirty bombs.

25. Allison, n.2.
26. Ibid., p.31.

Sourcing radioactive material for a radiological bomb is relatively easy as several radioactive isotopes are being used for various commercial purposes ranging from research and industrial use to medical applications, and these are without adequate security in several places. The following are some of the major commercially used radioactive isotopes and their uses,

Table 1: Major Uses of Radioisotopes[27]

S.No	Radioisotopes	Uses
1.	Americum-241	Used in many smoke detectors for homes and businesses to measure levels of toxic lead in dried paint samples to ensure uniform thickness in rolling processes like steel and paper production and to help determine where oil wells should be drilled.
2.	Cadmium-109	Used to analyse metal alloys for checking stock, scrap sorting.
3.	Calcium-47	Important aid to biomedical researchers studying the cellular functions and bone formation in mammals.
4.	Californium-252	Used to inspect airline luggage for hidden explosives to gauge the moisture content of soil in the road construction and building industries and to measure the moisture of materials stored in soils.
5.	Carbon-14	Major research tool. Helps in research to ensure that potential new drugs are metabolised without forming harmful by-products. Used in biological research, agriculture, pollution control and archaeology.
6.	Cesuim-137	Used to treat cancerous tumours, to measure correct patient dosages of radioactive pharmaceuticals, to measure and control the liquid flow in oil pipelines to tell researchers whether oil wells are plugged by sand and to ensure the right fill level for packages of food, drugs, and other products. (The products in these packages do not become radioactive.)
7.	Chromium-51	Used for research in red blood cell survival studies.
8.	Cobalt-57	Used as a tracer to diagnose pernicious anaemia.

27. "Major Uses of Radioisotopes," https://www.idph.state.ia.us/eh/common/pdf/radiological_health/radioisotopes.pdf. Accessed on September 25, 2014.

9.	Cobalt-60	Used to sterilise surgical instruments and to improve the safety and reliability of industrial fuel oil burners. Used in cancer treatment, food irradiation, gauges, and radiography.
10.	Copper-67	When injected with monoclonal antibodies into a cancer patient, helps the antibodies bind to, and destroy, the tumour.
11.	Curium-244	Used in mining to analyse material excavated from pits and slurries from drilling operations.
12.	Gallium-67	Used in medical diagnosis.
13.	Iodine-123	Widely used to diagnose thyroid disorders and other metabolic disorders, including brain function.
14.	Iodine-125	Major diagnostic tool used in clinical tests and to diagnose thyroid disorders. Also used in biomedical research.
15.	Iodine-129	Used to check some radioactivity counters in in-vitro diagnostic testing laboratories.
16.	Iodine-131	Used to treat thyroid disorders (Graves's disease).
17.	Iridium-192	Used to test the integrity of pipeline welds, boilers and aircraft parts and in brachytherapy/tumour irradiation
18.	Iron-55	Presence of sulphur in the air. Used in metabolism research.
19.	Krypton-85	Used in indicator lights in appliances such as clothes washers and dryers, stereos, and coffee makers to gauge the thickness of thin plastics and sheet metal, rubber, textiles and paper and to measure dust and pollutant levels. Used to detect explosives, and in voltage regulators and current surge protectors in electronic devices, and in electron capture detectors for gas chromatographs.
20.	Nickel-63	Used to detect explosives, and in voltage regulators and current surge protectors in electronic devices, and in electron capture detectors for gas chromatographs.
21.	Phosphorus-32	Used in molecular biology and genetics research.
22.	Phosphorus-33	Used in molecular biology and genetics research.
23.	Plutonium-238	Has powered more than 20 NASA spacecraft since 1972.

24.	Polonium-210	Reduces the static charge in production of photographic film and other materials
25.	Promethium-147	Used in electric blanket thermostats and to gauge the thickness of thin plastics, thin sheet metal, rubber, textile and paper.
26.	Radium-226	Makes lighting rods more effective.
27.	Selenium-75	Used in protein studies in life science research.
28.	Sodium-24	Used to locate leaks in industrial pipe lines and in oil well studies.
29.	Strontium-85	Used to study bone formation and metabolism.
30.	Strontium-90	Used in survey metres by schools, the military and emergency management authorities. Also used in cigarette manufacturing sensors and medical treatment.
31.	Sulphur-35	Used in genetics and molecular biology research.
32.	Technetium-99m	The most widely used radioactive pharmaceutical for diagnostic studies in nuclear medicine. Different chemical forms are used for the brain, bone, liver, spleen and kidney imaging and also for blood flow studies.
33.	Thallium-201	Used in nuclear medicine for nuclear cardiology and tumour detection
34.	Thallium-204	Measures the dust and pollutant levels on filter paper and gauges the thickness of plastics, sheet metal, rubber, textiles and paper.
35.	Thoriated Tungsten	Used in electric arc welding rods in construction, aircraft, petrochemical and food processing equipment industries. Produces easier starting, greater arc stability and less metal contamination.
36.	Thorium-229	Helps fluorescent lights last longer
37.	Thorium-230	Provides colouring and fluorescence in coloured glazes and glassware
38.	Tritium	Major tool for biomedical research. Used for life science and drug metabolism studies to ensure the safety of potential new drugs for self-luminous aircraft and commercial exit signs, for luminous dials, gauges and wrist watches to produce luminous paint, and for geological prospecting and hydrology.

39.	Uranium-234	Used in dental fixtures like crowns and dentures to provide a natural colour and brightness.
40.	Uranium-235	Fuel for nuclear power plants and naval nuclear propulsion systems and used to produce fluorescent glassware, a variety of coloured glazes and wall tiles.
41.	Xenon-133	Used in nuclear medicine for lung ventilation and blood flow studies.

Even among these radioactive isotopes, only some are considered highly dangerous, capable of causing damage to life. A study done by the Centre for Non-Proliferation Studies finds that among millions of commercially available radioactive isotopes, only a few are highly dangerous because of their portability, dispensability and higher levels of radioactivity. As a rule, the more dangerous commercial sources are those containing relatively large amounts of radioactivity (typically more than a few curies—greater than a hundred gigabecquerel—worth of radioactivity) of seven reactor-produced radioisotopes: Americium-241, Californium-252, Cesium-137, Cobalt-60, Iridium-192, Plutonium-238 and Strontium-90. Some of these isotopes (Americium-241, Californium-252 and Plutonium-238) would only pose internal health hazards by means of ingestion or inhalation, while the others would present both internal and external health hazards because the emitted ionising radiation could penetrate the dead outer layer of human skin.[28]

The same study finds that RDDs are not weapons of mass destruction that could result in massive human casualties. "Few, if any, people would die immediately or shortly after the use of an RDD from exposure to the ionizing radiation from such a device, although, depending on its placement and size, many individuals might die from the conventional bomb blast if this method were used to disperse radiological materials. Most people not directly affected by the conventional blast would receive relatively low doses of ionizing radiation, even from weapons using the seven high-security threat radioactive isotopes, and possible cancer deaths would usually require years to decades to develop. Nonetheless, an RDD can be a weapon of mass

28. Charles D. Ferguson, Tahseen Kazi and Judith Perera , "Commercial Radioactive Sources: Surveying the Security Risks," Centre for Non-Proliferation Studies, Occasional Paper no: January 11, 2003, http://www.cns.miis.edu/pubs/opapers/op11/op11.pdf

A radiological attack would leave the place of the explosion highly contaminated and it would take a long time and huge resources to decontaminate the affected area.

disruption or dislocation. Preying on the public's fears of radioactivity, terrorists who used RDDs would try to cause panic."[29] Creating panic and terror is the primary objective of terrorists. A radiological attack would leave the place of the explosion highly contaminated and it would take a long time and huge resources to decontaminate the affected area. Even a couple of attacks would impact the economy of the state as stock markets would suffer and might hurt the confidence of the investors investing in the country. Though it would be temporary, it would cause immense psychological impact on the affected state. Hence, adequate security measures need to be put in place to prevent any chance of non-state actors acquiring radioactive materials to build such devices.

SABOTAGE OF NUCLEAR FACILITIES

Nuclear terrorism could also be orchestrated by way of sabotage. There is a possibility that terrorists could sabotage nuclear facilities like nuclear reactors and nuclear waste storage sites. The easiest way would be to do it with insider help. Sabotaging a nuclear reactor is a relatively complex issue which would require good knowledge of the functioning of the reactor and the entire power generation cycle in the facility. The reactor building would be hard to penetrate, but some facilities of the nuclear power generating loop are located outside the reactor building like the condensing tower, back-up power facilities, water supply lines and the pumping stations. These facilities could be targeted by terrorists and if sufficient and timely actions are not taken for control, the chain reaction it might result in the reactor getting damaged, and possibly resulting in radiation fallout. But, the possibility depends on proper knowledge about that particular reactor design and the kind of coolant and the moderator used. By fiddling with the nodes in the nuclear power generation loop and the backup systems located outside the reactor building, there is a possibility to cause a loss of coolant damage and

29. Ibid.

explosion. Hence, adequate safety measures, particularly physical security should be provided to the nuclear power generation facilities.

The nuclear waste storage facility could also be targeted by the terrorists if adequate security is not provided to it. Nuclear waste is mostly stored inside exhausted underground mines and these facilities are mostly not provided adequate security. The radioactive wastes are sealed in radioactive tight containers. Any punctures or damage to these containers could result in deadly radioactive release.

The only way to prevent nuclear materials that could be used to build weapons falling into the hands of terrorist organisations, is to take measures on a continuous basis to secure these materials.

INTERNATIONAL INITIATIVE TO PREVENT NUCLEAR TERRORISM

The only way to prevent nuclear materials that could be used to build weapons falling into the hands of terrorist organisations, is to take measures on a continuous basis to secure these materials. Towards this endeavour, one of the biggest initiatives in recent times comprises the Nuclear Security Summits (NSS) that are being held since 2010. This is, according to the US President Barack Obama, "a new international effort to secure vulnerable nuclear material around the world".[30] The inaugural summit took place in March 2010 in Washington which was attended by nearly 50 heads of states. The second summit was held in Seoul in 2012 and the third was held in the Hague in 2014. Communiqués are produced in every summit to garner commitment from the participating nations to achieve key nuclear security goals, including:

- Minimising the use of HEU;
- Bolstering security at nuclear facilities through international instruments and organisations such the IAEA;
- Instituting measures to detect and prevent illicit trafficking in nuclear and other radioactive materials; and,

30. "Nuclear Security Summits", http://www.state.gov/t/isn/nuclearsecuritysummit/, April 13, 2010. Accessed on October 6, 2014.

- Establishing Centres of Excellence in the participating states to address the need for capacity building, technology development, and coordination of assistance on nuclear security.[31]

Considerable success has been observed on the part of countries in honouring and acting on their commitments as declared after the 2010 and 2012 Summits. Various organisations have stated that 95 percent of the commitments made in Washington have been completed as of 2013.[32]

Some of the significant achievements are[33]:

- Since 2009, 12 countries worldwide (Austria, Chile, the Czech Republic, Hungary, Libya, Mexico, Romania, Serbia, Taiwan, Turkey, Ukraine and Vietnam) have **removed all HEU from their territory.**
- 26 of the 28 NSS countries that had at least 1 kg of HEU at the time of the Washington Summit **indicated that they have taken action to reduce the amount of dangerous nuclear material.**
- Since the Seoul Summit, at least 15 metric tonnes of **HEU have been down-blended** to Low Enriched Uranium (LEU), which will be used as fuel for nuclear power plants. This is equivalent to approximately 500 nuclear weapons.
- 17 NSS countries have **converted,** or are in the **process of converting,** at least 32 of their own **research reactors** or **medical isotope production facilities**.
- Nine NSS countries reported that they were **researching and developing** techniques that use LEU instead of HEU.

The 2014 Hague Communiqué addresses several issues to strengthen the international nuclear security architecture like legal instruments, role of the IAEA, role of the United Nations, role of other international initiatives and voluntary measures. Relating to physical security of nuclear materials the communiqué addresses issues such as nuclear safety and security,

31. Ibid.
32. Ibid.
33. "Results of NSS 2014", https://www.nss2014.com/en/nss-2014/results, 2014. Accessed on October 8, 2014.

nuclear industry, information and cyber security, nuclear transportation, illicit trafficking and nuclear forensics.[34]

OTHER INITIATIVES TO SECURE NUCLEAR MATERIALS

Apart from the Nuclear Security Summits (NSS) there are other initiatives undertaken by the IAEA as well as some bilateral agreements and cooperation. The IAEA Nuclear Safety and Security Department deals with the nuclear material security aspects. The IAEA publishes a lot of materials relating to nuclear security, including frameworks, periodic information on issues relating to prevention and detection of, and response to, theft, sabotage, unauthorised access and illegal transfer or other malicious acts involving nuclear material and other radioactive substances and their associated facilities.[35] It also undertakes various legal measures for nuclear safety and security by various conventions, code of conducts and treaties and agreements. Conventions are legally-binding while codes of conduct are non-legally binding.[36]

Despite these measures, there are still weak links which need to be collectively addressed to ensure a high level of security of nuclear materials. The Nuclear Threat Initiative (NTI) brings out the inadequacies that still exist in this area and also lists the challenges in moving towards addressing the shortcomings. According to NTI, the major challenges in creating an effective global system for securing weapons-usable nuclear materials is that each state considers materials security an exclusively sovereign, not shared, responsibility. And approaches to nuclear security vary widely, with little sense of accountability, even though poor security in any one state can affect all other states.[37] It further lists out the following factors,

- The existing legal foundation for global nuclear security remains weak.
- Participation in international peer review is still limited.

34. https://www.nss2014.com/sites/default/files/documents/the_hague_nuclear_security_summit_communique_final.pdf
35. "IAEA Nuclear Security Series", http://www-ns.iaea.org/security/nuclear_security_series.asp?s=5&l=35 , September 17, 2014. Accessed on October 12, 2014.
36. "Conventions and Codes", http://www-ns.iaea.org/conventions/default.asp?s=6&l=44, 08 April 2014. Accessed on October 12, 2014.
37. "Key Trends (NTI Nuclear Materials Security Index, 2014 Findings)", http://ntiindex.org/data-results/2014-findings/, 2014. Accessed on October 12, 2014.

- The vast majority of global stocks of weapons-usable nuclear materials—approximately 85 percent—is military or other non-civilian material and remains outside any of the existing international nuclear security mechanisms.[38]

Broadly speaking, nuclear material security can be achieved by strong domestic measures like stringent laws for handling these materials and local monitoring and mechanisms for proper implementation of these laws. The first thing would be to undertake proper accounting of all the nuclear materials in the country, the suppliers, the end users and the disposal methods and mechanisms and sites.

CONCLUSION

It is clear that nuclear terrorism is very much a possibility. For a committed extremist group with sufficient financial resources and the right connections, it is possible to acquire the necessary materials to build a nuclear weapon or a radiological dispersal device at the least. The primary issue in this regard is the accumulation of radioactive and fissile material around the world and the way it is secured. In several places, particularly in the states of the former Soviet Union, it is believed that the fissile material storage sites are not provided sufficient security as there have been several cases of fissile material theft where the source of the materials was traced to one of those states.

Securing commercial radioactive isotopes is even harder as several private organisations are the end users of these materials. Despite several initiatives, both domestic and international, there is still a huge gap that needs to be filled. The efforts to secure nuclear materials need to be coordinated and a solution to be found to overcome the sovereignty concerns of states at least to regulate and secure the commercially used radioactive materials.

38. Ibid.

INDIA'S STAND ON INTERNET GOVERNANCE: OXYMORONIC OR OPPORTUNISTIC?

ASHISH GUPTA

The internet, as we know it today, is often hailed as a *beacon of knowledge*, a harbinger of freedom through empowerment, a strong proponent of freedom of expression and a place for exchanging ideas without fear of prosecution or punitive action. The birth of the internet shook the very foundation of sovereignty as propagated by the dominant 'Westphalian conceptions'. The internet was wild, unhindered and unencumbered by anyone or anything, transcending the physical boundaries with impunity and hubris. The virtual space used by the internet and its operatives became so well recognised that it was even christened with an appropriate name: cyberspace. Independence was the structural yarn used for weaving the fabric of the internet as we know it today. The agnostic nature of the standards and protocols used does not differentiate between creed, culture or countries. An attempt to block internet traffic is treated as a technology hitch and the traffic is rerouted through seemingly infinite networks. "The Net interprets censorship as damage and routes around it."[1] There is a widely held view that it "is not a physical place—it defies measurement in any physical dimension or time space continuum. It is a short-hand term that refers to the environment created by the confluence of cooperative networks

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1. "John Gilmore's Maxim", http://techpresident.com/networked-public-sphere. Accessed on January 25, 2015.

During the 'the Cuban crisis', the lack of exchange of information, cogently and coherently, among several of the powers involved, exacerbated the situation and brought the world to the brink of a global nuclear war.

of computers, information systems, and telecommunication infrastructures commonly referred to as the World Wide Web."[2]

The precursor to the internet comprised collective efforts, in the backdrop of strategic imperatives of the US to design a system capable of withstanding missile attacks. The Cuban missile crisis of 1962 was arguably a catalytic factor that fuelled the dramatic development of the internet. During the 'the Cuban crisis', the lack of exchange of information, cogently and coherently, among several of the powers involved, exacerbated the situation and brought the world to the brink of a global nuclear war. Taking cognisance of its impact on the situation, under direct orders from President Kennedy, the National Security Council (NSC) constituted an interdepartmental committee to examine the communications networks and institute changes. In 1963, in order to provide improved communication support to critical government functionaries during emergencies, President Kennedy established the National Communications System (NCS). The NCS was mandated to link, improve and extend communications to components of various federal agencies, focussing on interconnectivity and survivability. In this backdrop, in August 1962, computer scientist JCR Licklider at the Massachusets (MIT) conceptualised the "Intergalactic Computer Network",[3] envisioning a global network of computers through which everyone could quickly access data and programmes from geographically dispersed sites. Later that year, Licklider moved over to the Defence Advanced Research Projects Agency (DARPA) to head the development project. In 1964, Paul Baran of the RAND Corporation, proposed architecture of a new kind of a network of computers, a packet-switched network, capable of surviving an enemy attack due to its inherent

2. Thomas C. Wingfield, "The Law of Information Conflict: National Security Law in Cyberspace", August 21, 2000.
3. "Internet Hall of Fame Pioneer J.C.R. Licklider", http://www.internethalloffame.org/inductees/jcr-licklider. Accessed on January 25, 2015.

resilience[4]. In 1967, driven by Licklider's vision and Baran's architecture, the Advanced Research Projects Agency (ARPA) embarked on a research project to build a network. The first four nodes of the ARPAnet became operational in early 1970. By 1981, the ARPAnet had grown to about 200 nodes and a basic suite of protocols (TCP/IP, FTP, Telnet, SMTP) was developed. During this time, the Europeans' endeavours in the field of networking culminated in development of the ISO (International Standards Organisation) seven-layer model of protocol architecture. By 1990, the emerging internet had grown to over 150,000 computers and was expanding exponentially.

In the year 1989, Tim Berners-Lee, a computer scientist specialising in networking, was working at the "Conseil Européen pour la Recherche Nucléaire" or European Council for Nuclear Research (CERN) in Switzerland. Using the initial vision of Licklider and Nelson as the springboard, he proposed a paper on information management systems that discusses, "The Problems of Loss of Information About Complex Evolving Systems and Derives a Solution Based on a Distributed Hypertext System."[5] Though it was termed as *"vague, but exciting"* by his boss, Berners-Lee was permitted to continue on the project. By 1990, Berners-Lee could define the web's basic building blocks, the URL, http and html and wrote the first browser and server software. Working on the 'NEXT' computer at CERN, he named the first web server as 'Info.cern.ch' and the world's first web page was addressed as 'http://info.cern.ch/hypertext/WWW/ Project.html', containing information and details of the world wide web project. As CERN was primarily using particle accelerators and detectors to boost beams of particles to high energies and was at the helm of high-energy-physics, in 1991, an early version of a world wide web system was released to the high-energy-physics community that included a simple browser, server software and a library of essential functions for designing custom software. In 1993, CERN put the web in the public domain, ensuring that it would remain an open standard and released the source code of Berners-Lee's hypertext project, 'World Wide Web' on the same day. The move, while heralding the expansive and unhindered growth of the internet,

4. "Paul Baran and the Origins of the Internet", http://www.rand.org/about/history/baran.html. Accessed on January 25, 2015.
5. "The Birth of the Web", http://home.web.cern.ch/topics/birth-web. Accessed on January 25, 2015.

The internet, conceived in the era of limited computing and time-sharing, has not only survived, but thrived, and has grown by leaps and bounds. New technology, standards of networks and computational methodologies, have been seamlessly adopted and assimilated by the internet.

saw the 'World Wide Web' accounting for most of the internet traffic.

On October 24, 1995, the Federal Networking Council (FNC), in consultation with members of the internet and intellectual property rights communities came up with the definition of the term "internet"[6]. As per the definition, the "internet" refers to the global information system that:

- Is logically linked together by a globally unique address space based on the Internet Protocol (IP) or its subsequent extensions/ follow-ons.
- Is able to support communications using the Transmission Control Protocol/ Internet Protocol (TCP/IP) suite or its subsequent extensions/ follow-ons, and/or other IP-compatible protocols
- Provides, uses or makes accessible, either publicly or privately, high level services layered on the communications and related infrastructure described herein.

The internet, conceived in the era of limited computing and time-sharing, has not only survived, but thrived, and has grown by leaps and bounds. New technology, standards of networks and computational methodologies, have been seamlessly adopted and assimilated by the internet. An enterprise conceived, developed and nurtured by a small group of dedicated researchers, from a humble beginning has grown to become an all pervasive entity intricately woven into the fabric of the social and political life of all *inhabitants of this planet*. A sterling example of commercial success, the internet dictates the way businesses are negotiated, facilitated and conducted. If we take into account the indelible impact of the internet on today's society, the issues related to its management and governance become paramount over insular and parochial interests of *individuals, societies and nations.*

6. "Definition of Internet", https://www.nitrd.gov/fnc/Internet_res.aspx. Accessed on January 25, 2015.

INTERNET GOVERNANCE

Since the time the internet made its foray into the public domain and opened to commerce, the term "**internet governance"** has evolved. The term, at first referred to the policy issues for its portability, operability, sustenance and reliability, and later encompassed the issues related to management of domain names and IP addresses. As the internet became ubiquitous, the definition also broadened considerably. In 2005, the UN-sponsored World Summit on the Information Society defined internet governance as "the development and application by governments, the private sector and civil society, in their respective roles, of shared principles, norms, rules, decision-making procedures, and programs that shape the evolution and use of the internet." [7] An equitable distribution of internet resources, unfettered and multilingual access to all and a stable and secure functioning of the internet constitute the core of internet governance .

However, some nations are wielding the internet's unprecedented growth to extract greater political and economic mileage in international arenas. The issues related to internet governance have become highly contentious and political, leading to acrimonious confrontations between the developed and developing states. Technologies over which the internet rides and resides in, historically, came into being during the initial development, consolidation and refinement phases. With the emergence of new challenges such as freedom of expression, internet infrastructure security and stability, the policy role of internet companies, efficacy of internet protocols, internet control systems such as the Domain Name System (DNS) and the relationship between intellectual property rights enforcement and internet architecture, the issue of internet governance has become more complex and variegated. Preservation of national security, protection of economic interests, prevention of societal disharmony and containment of internal dissident elements are some of the concerns, adding further complexities to the already tumultuous realm of internet governance.

At the heart of internet governance is designing and administration of the technologies necessary to keep the internet operational followed by a formal and substantive mechanism governing the use of these technologies. This

7. Château de Bossey, "Report of the Working Group on Internet Governance", June 2005, p.4.

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technical scaffolding involves critical internet resources, technical standards for integrity and interoperability, interfaces for man-machine interaction such as search engines, information access and exchange points, etc. Some of the challenges which need to be addressed before a consensus and conceptual framework for internet governance may be built are given below.[8]

Agnostic Arrangement of Technical Architecture

The technical foundation used to build the internet may appear pragmatic and agnostic in nature, free from the shackles of political and cultural imperatives. However, as Jasanoff puts it, technology "both embeds and is embedded in social practices, identities, norms, conventions, discourses, instruments, and institutions—in short, in all the building blocks of what we term the social." [9] Technology, *per se* is an inanimate entity used as a tool to set in motion, and to sustain, the momentum generated by the internet. Internet governance decisions are often based as much upon technological imperatives as on how to regulate and control the usage of these. For example, technology dictates that the domain name and corresponding internet address need to be globally unique, but allocation and control call for institutional coordination and control. The issue has become central to the global struggle for internet governance since the early 1990s.

Use of Internet Governance Technologies for Content Control and Information Censorship

The enactment of policies governing the use of internet technologies for content control and censorship has become the norm, albeit a draconian one, among many nations. In the garb of intellectual property rights protection, law enforcement functions or for strangulation of voices calling for political reforms, internet governance technologies are increasingly leveraged to curtail

8. Laura Denardis, *The Global War for Internet Governance* (Yale University Press, 2014), p.7.
9. Sheila Jasanoff, *States of Knowledge: The Co-Production of Science and the Social Order* (Routledge, 2004), p. 3.

free flow of information and for content control. Traditionally, institutionalised centres of power have resorted to censorship of information and after sieving the information through the mesh of their perceived values and interests, made it accessible to the masses. The internet has deprived these centres of the power of being selective or in denial mode about information and its flow deemed detrimental to their core interests. Internet governance infrastructure is routinely used to block, filter or censor access to information, to disseminate misinformation or to create a system of mass surveillance.

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Privately Owned and Controlled Internet Governance Technologies

Historically, most internet governance functions were executed out of the domain of governments, via private ordering, technical design and new institutional forms. Internet governance policies were enacted in specific contexts of technological and social change. Sovereign governments, in an effort to regulate activities within or through their boundaries as constitutionally legally mandated or otherwise, oversee many internet governance functions such as enactment of laws against cyber crime, cyber terrorism, espionage, computer fraud or social disharmony.

Internet as an Instrument in Global Conflict

The use of the internet as a tool by exploiting its implicit character via technology, policy formulation and restrictive regulation, for political, commercial and security reasons, has given rise to global tensions. In a blatant digression from its promised goal of upholding democratic values and freedom of expression, internet governance control is being used for content censorship, mainstream media control, mass surveillance of citizens and shaping the public opinion for the furtherance of nefarious designs. Central to internet governance are conflicts over issues of ethicality, morality, cultural and political rights, intellectual

property rights protection and national security.[10] Earnest efforts for conflict resolution over these issues require technical innovation, governments' intent and private participation. Articulation and implementation of policies and procedures to have internet control/regulation points directly have exacerbated in building up global tensions.

Parochial Geo-political Outlook in Internet Globalisation

The stability and security of the internet is in the common interest of all nations. Nations have to deal with enduring global problems such as terrorism, environmental degradation, climate change and contagious diseases, which require cumulative, collective and congruent efforts. While losing sight of greater goals, the petty squabbling to grab a larger share of the pie over internet governance is denying the global aggrandisement of internet governance .

Globally, a loose consensus, comprising certain shared fundamental economic, political and social beliefs, is developing to unshackle the internet from the historic and hegemonic control of US companies supposedly protecting US interest. Central to this debate is disagreement among many internet governance stakeholders over who controls the "Critical Internet Resources (CIR)." Though not physical, these virtual resources are finite and indispensible for use, access and operation of the internet. Without the virtual resources such as internet addresses, domain names, and Autonomous System Numbers (ASNs), even with the swankiest computer and high speed fibre optic network, the internet will be as elusive as the proverbial unicorn.

An Internet Protocol (IP) address is a numerical value assigned to each device (e.g. computer, printer) willing to be a part of a network that uses the Internet Protocol for communication. Every device accessing the internet requires a unique binary number called an IP address. The domain names provide a humanly recognisable and easily memorable form, dispensing with the requirement of making sense of an esoteric string of binary numbers. Domain names, such as www.google.com are used to locate web sites. When a domain name is typed into a browser address bar, the internet's Domain

10. Ibid.

Name System (DNS) translates this name into unique binary numbers for locating the web site. An ASN is a binary number assigned to a network operator that connects to the global internet. These network operators are usually described as autonomous systems. ASNs are valuable because receiving a globally unique ASN is a prerequisite for an internet service provider's network to become part of the global internet.

The structural framework over which the internet governance infrastructure is stitched together came into being as part of viable and workable technological solutions. No legal or commercial considerations were factored in during the development phase. The growth and transnational reach of the internet has seen significant changes in objectives, roles and administrations of institutions responsible for coordinating CIRs. Understanding the functioning of these groups involves circumnavigating through an acronym thicket of global institutions, including Internet Assigned Numbers Authority (IANA), Internet Corporationf for Assigned Names and Numbers (ICANN), Regional Registration Registries (RIRs), root zone server operators, domain name registrars, registries, and various other entities. The nuances of internet governance can be captured by familiarisation with institutional structures that centrally oversee critical internet resources, control root zone files, operate DNS servers, manage registrar systems for assigning domain names and distribute internet numbers via RIRs.

IANA AND ICANN

In early internet history, management of names and numbers began with a single person. Christened as "God of the internet", Jon Postel, a computer scientist from the University of South California (UCLA), who was involved in early work of the ARPANET, along with his colleagues, performed the role of the central coordinating functionary for assignment of names and numbers. As the Internet Assigned Numbers Authority (IANA), Postel and his colleagues, under contract with the US Department of Commerce, were responsible for:

- The coordination of the assignment of technical internet protocol parameters.
- The administration of certain responsibilities associated with the internet DNS root zone management.

Formed in 1998 under a contract with the US government, ICANN is a private, non-profit entity with an official mandate to provide technical coordination of core internet resources, most notably domain names.

- The allocation of internet numbering resources.
- Other services related to the management of the Address and Routing Parameter Area (ARPA) and INT Top-Level Domains (TLDs).[11]

Though the work was crucial, it was bereft of any major controversy. During that period, the network was primarily an American phenomenon and was yet to realise its full potential of having a global presence, and close to four billion users. IANA eventually became a function under the Internet Corporation for Assigned Names and Numbers (ICANN). Formed in 1998 under a contract with the US government, ICANN is a private, non-profit entity with an official mandate to provide technical coordination of core internet resources, most notably domain names. Though incorporated in the state of California, it wields considerable authority, directly or indirectly, over all users of the internet. To rein in unbridled growth of the internet without order and regulation, ICANN is mandated to create, enact and promulgate enforceable regulations. However, depending on one's frame of reference, the creation and functioning of ICANN can be prescribed as a panacea for, or branded as the root cause of, the ailments.

Transition of communications over the internet is different from our understanding of the classical communication process, which requires establishment of a dedicated channel over which transition of information takes place as one unbroken entity. Over the internet, messages are broken up into manageable packets and are exchanged over many independent networks following different paths, from source to destination. The lack of a central communication channel or information pathway makes the process of policy promulgation and enforcement across all the information traffic over the internet extremely difficult. ICANN realises this through its control of the

11. "C.2.9 of Contract Between US Department of Commerce (DoC) and Internet Assigned Numbers Authority (IANA) dated Jul 02, 2012", http://www.ntia.doc.gov/files/ntia/publications/sf_26_pg_1-2-final_award_and_ sacs.pdf. Accessed on January 30, 2015.

internet's DNS. Internet addressing, as realised in the DNS, is centralised and provides the control point from which to regulate users. Denial of access to domain names is the equivalent to declaring someone a pariah from the internet community. The DNS also defines jurisdictions on the internet. The logical organisation of the DNS allows authority to be mapped onto distinct zones. Collectively, these features render ICANN capable of governance .

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ROOT ZONE MANAGEMENT

Root zone refers to the highest level of the DNS structure. It contains the names and the numeric IP addresses for all the top level domain names such as the Generic Top-Level Domain (gTLDs) (.com, .net, .org, .jobs), and all the Country Code Top Level Domains (ccTLDs), for example (.us, .uk .ph), including the entire list of all the root servers.[12] "Root Zone Management" involves the processes by which changes are made to the root zone file and root WHOIS (a query and seek protocol for querying databases of registered users of the internet resource). Root zone management involves three roles performed by three different entities mandated to do so under the provisions of legal agreements.

- IANA is responsible for managing the content of the root zone based on the policies adopted by ICANN. It transmits requested changes in TLD data to the Root Zone Maintainer (Verisign) and the Administrator (NTIA).
- The NTIA as administrator approves any changes, additions or deletions from the root zone file.
- Verisign under a cooperative agreement with NTIA, performs the role of the root zone maintainer. After approval from NTIA, Verisign implements changes in the root zone file. While IANA is supposed to determine the *content* of the root zone file, VeriSign actually edits the root zone data, cryptographically signs it and distributes the resulting content to the root server operators.

12. "Root Zone", http://icannwiki.com/index.php/Root_Zone. Accessed on January 25, 2015

Operation of the Root Name Servers

The root zone files are contained in a group of servers for distribution of this information to the world. This system of root name servers is controlled by 12 organisations with 13 distinct root server implementations. Each of the root name servers contains the most current root zone database. These root servers are the gateway to the DNS so operating these servers is a critical task involving great responsibilities in both logical and physical management. Many of these server implementations are operated by American institutions such as governmental agencies, including the National Aeronautics and Space Administration (NASA) and the Department of Defence (DoD), American universities, including the University of Maryland, and corporations, including VeriSign and Cogent.

CONTROLLING INTERNET NUMBER DISTRIBUTION

Internet access is possible only with a legitimate IP address, which is usually provided through an Internet Service Provider (ISP). ISPs are generally allocated with a block of IP addresses for sub-division. In addition, to be a network operator further requires an ASN. The organisations that control the allocation and assignment of these numbers serve an essential internet governance function. IANA has retained its historic role as the organisation centrally responsible for allocating IP addresses and ASNs, albeit now formally under the auspices of ICANN. IANA, in turn, delegates reserves of addresses and assignment authority to five Regional Internet Registries (RIRs), central and influential institutions in the internet governance landscape. For example, APNIC (Asia-Pacific Network Information Centre) has been delegated with the responsibility of the Asia-Pacific regions. These RIRs, in turn, allocate address space to Local Internet Registries (LIRs) or selected National Internet Registries (NIRs) for further allocation or assignment to ISPs and end user institutions. For example, the Indian Registry for Internet Names and Numbers (IRINN) provides allocation and registration services of IP addresses and AS numbers in India.

CRITICAL INTERNET RESOURCES (CIR) MANAGEMENT

The availability and accessibility of CIR, coupled with historical aspirations

and future premises, has triggered a high profile, prolonged and hostile debate over centralised control, consensually agreed regulations and enactment of legally binding rules. A number of formally enacted agencies as well as a multitude of loosely connected organisations are providing platforms for debating internet governance issues, championing the cause of specific groups of stakeholders. Topping them all is the lack of consensus over the acceptance of a global model for internet governance. The proponents and opponents of the 'multi-stakeholder' model and 'multilateral' model are at loggerheads with each other. There is still another school of thought, propounding the idea of identifying the internet as one of the 'Global Commons' at par with the high seas; the atmosphere; Antarctica and, outer space, outside of the political reach of any one nation-state. Many advocate the 'multi-stakeholder model' in which all stakeholders, whether from the private sector, government, academia, civil society or non-governmental organisations, participate in the policy development process. The multilateral model provides a level playing field for participants in which all participants, large and small, have an equal say in policy decisions.

NETMUNDIAL

Edward Snowden's revelations comprised a defining moment in more ways than one. These have amply demonstrated that internet technologies, though transformative and emancipatory, have existential and potential risks to cause global disharmony. The general disposition among those who feel alienated and angry after the Snowden revelations can be gauged by the tone and tenor of discussions at the NETmundial on the "International Telecommunication Union (ITU) Plenipotentiary in November 2014" in São Paulo, Brazil, on April 23 and 24, 2014. In Portuguese, "NETmundial" implies the future of internet governance. On the implementation of a different model of internet governance, the Brazilian government and representatives of the European Commission articulated that internet governance should be:

- Open, multilateral and democratic governance , carried out with transparency by stimulating collective creativity and with the participation of society, governments and the private sector;

- A real multi-stakeholder governance model based on the full involvement of all relevant actors and organisations[13].

During the NETmundial, a roadmap for a different model of internet governance was proposed, incorporating the following:

- Combating all violations of human rights in cyberspace;
- Consolidation of a decentralised multilateral internet governance, interoperable and truly established in a consensual way with all users of public space: the governments, the entrepreneurs of the private sector and the civil society organisations;
- Guarantee of defence of net neutrality, against the restrictions arising from the economic interests of some monopolies in the business of telecommunications;
- Construction of mechanisms to prevent the illegal practices of surveillance and espionage of military and private industries in cyberspace;
- Restoration of confidence, credibility and tranquillity in cyberspace, from the creative and collective work maintained by the representative actors of governments, entrepreneurs of the private sector and civil society organisations.[14]

INDIA AND INTERNET GOVERNANCE

India in its official submission at the NETmundial, while acknowledging the importance of an open, stable and secure internet as crucial to global connectivity, innovation and economic development, recommended a transformational shift from the internet of today to the "Equinet" of tomorrow. While proposing the structure of internet governance as multilateral, transparent, democratic and representative, with the participation of governments, the private sector, civil society and international organisations, in their respective roles, India acknowledged these as the foundational principles of internet governance.

Prior to NETmundial, at the World Summit on the Information Society (WSIS), the endorsement by the UN General Assembly of the "Tunis Agenda

13. "Roadmaps for a Multilateral Decentralized Internet Governance ",http://content.netmundial.br/ contribution / roadmaps-for-a -multilateral-decentralized-internet-governance/217". Accessed on January 25, 2015.
14. Ibid.

for the Information Society' of 2005 saw the creation of the 'Internet Governance Forum' (IGF) as a platform for a multi-stakeholder policy dialogue. The IGF aims to provide a unique multi-stakeholder platform for the discussion of public policy issues related to key elements of internet governance in order to foster the sustainability, robustness, security, stability and development of the internet.[15] In its official statement at the NETmundial, India endorsed, "International law and in particular the Charter of the United Nations, is applicable and is essential in maintaining security and stability and promoting an open, secure, peaceful and accessible ICT environment. All governments should have an equal role and responsibility for ensuring stability, security, and continuity of the internet."

India is at pole position to swing the outcome of any debate on internet governance. India's assertive role in this respect is highlighted by the opening statement made by the Indian representative at the NETmundial, "With over 200 million internet users, soon going to cross half a billion in the coming years, over 900 million mobile telephone subscribers, and a thriving and robust internet ecosystem, India is well poised and willing to play an important and constructive role in evolving the global internet governance ecosystem and in the process, make it more credible."[16] Though the representatives did not support the consensus view on the NETmundial outcome document, India's active participation was a measure of willingness to bridge the "trust deficit". India's position on the future of internet governance at the NETmundial can be gauged by the following official statement:

- The global credibility and universal acceptability of the internet governance ecosystem is possible if it is "representative, democratic, transparent and accountable, involving governments and other stakeholders as per the Tunis Agenda"[4].
- The second is that "given its profound importance, there is also a need for the various facets of the [*sic*] internet governance , including the core

15. "World Summit of the Information Society WSIS Action Lines Executive Summaries (Achievements, Challenges and Recommendations) WSIS+10 High-Level Event Geneva 2014", www.itu.int/wsis/review/ inc/docs/phase6/v/r /wsis10-5-3.pdf. Accessed on January 25, 2015.
16. "Statement by Mr Vinay Kwatra, Indian representative at the Global Multistakeholder Meeting on the Future of Internet Governance in Sao Paulo (April 23-24, 2014)", http://mea.gov.in/ Speeches-Statements.htm? dtl/23246/Statement+ by+Mr+Vinay +Kwatra+Indian+represent ative+at+the+Global+ Multistakeholder+ Meeting+on+the+Future+of+Internet+Governance +in+Sao+Paulo+April+2324+2014. Accessed on January 25, 2015.

The global credibility and universal acceptability of the internet governance ecosystem is possible if it is "representative, democratic, transparent and accountable, involving governments and other stakeholders as per the Tunis Agenda".

internet infrastructure, to be anchored in [an] appropriate international legal framework"[5].

These two statements echo the Indian government's resolve to tackle "strategic and policy challenges" to bring in more credibility and transparency in the global internet governance ecosystem. It unequivocally raised the following concerns:

- Lack of a truly representative and democratic nature of the existing systems of internet governance, including the management of critical Internet resources leading to a trust deficit in the system;
- Need for the internet governance ecosystem to be sensitive to the cultures and national interests of all nations, not just of a select set of stakeholders;
- Apparent inability of the current structures of internet governance to respond to some of the core and strategic concerns of the member states;
- Need to broad base and internationalise the institutions that are invested with authority to management [*sic*] and regulate the internet.[17]

The inequitable distribution of power in managing the internet resources and greater influence wielded by a few have been some of the reasons for the discord for India and other developing countries since the Tunis phase of the WSIS. Globally, a loose consensus, comprising certain shared fundamental economic, political and social beliefs, is developing to unshackle the internet from the historic control of a few. However, replacing the multi-stakeholder and dispersed model of internet governance with a centralised model may not translate into empowering the users. Government led control may be used to limit, restrict or deny the content on the internet. This will result in strengthening the "content control mechanism" at least in countries with oppressive, autocratic and oligarchic governments.

17. Ibid.

MULTI-STAKEHOLDER Vs MULTILATERAL MODEL OF INTERNET GOVERNANCE

On the issue of internet governance, the terms 'multi-stakeholderism' and 'multilateralism' have been used in many platforms by the Indian government. Both terms have evolved contextually in reference to the internet governance ecosystem over the last decade. Multi-stakeholder organisations such as ICANN have brought in a mechanism to improve its accountability. The UN has also acknowledged multi-stakeholderism through the 'Multi-stakeholder Preparatory Platform' for the WSIS+10 High Level Event in June 2014. There is wider acceptability towards consequential contributions made by non-government stakeholder groups. India, while commenting on the NETmundial draft outcome, noted: "There are no references to the Geneva Principles as well as the Tunis Agenda which form the bedrock for the ongoing global discourse on internet governance. Despite a clear recognition in the Tunis Agenda to a multilateral process apart from the multi-stakeholder approach in the evolution of the future roadmap on internet governance, we find no reference to it in this initial draft outcome document which you are considering now."

The Government of India, while articulating the model for the internet governance ecosystem, has reiterated "full involvement of governments and all other stakeholders". In other words, India is not entirely impervious to acceptance of some form of multi-stakeholderism – albeit as encapsulated in the Tunis Agenda. The limitation of this approach is that the "Tunis Agenda" acknowledges the role of civil society as a contributor "at community level"[14] only without defining the role it can have in policy-making. Moreover, in the NETmundial outcome, the Government of India's request for the incorporation of the provision of "sovereign right of governments as international policy authority for internet-related public policy issues" was also not entertained.

India's stand on internet governance can be gauged by its official position at various international platforms for debating the issue. At times, India may seem to have left little room for manoeuvre towards advocacy of the multi-stakeholderism model, central to its position on the "role of civil society' and 'assertion of state sovereignty over international internet -related public policy issues". Acceptance of India's viewpoint and its assimilation in policy

formulation in future may be speculative at this point of time. However, there is a global acceptance that the existing internet governance ecosystem needs reforms, irrespective of these being multi-stakeholder or multilateral in nature.

CONCLUSION

Internet governance is a highly complex and ever evolving form of governance which requires cognitive and technical scaffolding and Information and Communications Technology (ICT) resource management to fulfil the aspirational goals of civil societies, uphold civil liberties, and address national security imperatives. From being executed under the supervision of one person, today its enormous complexity has rendered even a multitude of agencies grappling to find viable and workable ways to make the internet governance ecosystem globally acceptable to all users. The policy-making has also evolved from predominantly US institutions to new global entities. India is at the cusp of the digital revolution and at pole position to swing the outcome of any debate on internet governance. The year 2015 will see many critical issues for internet governance being discussed globally. The WSIS is scheduled to provide the reviewed goals and envisaged policy framework to the UN General Assembly. The contract between the US Commerce Department and ICANN will expire in September 2015 and as per the US assertion,"It (US) would eventually transfer key internet domain name functions to a global multi-stakeholder community." In an official release, Dr. Stephen D. Crocker, chairman of ICANN's board, said, "Even though ICANN will continue to perform these vital technical functions, the US has long envisioned the day when stewardship over them would be transitioned to the global community. In other words, we have all long known the destination. Now it is up to our global stakeholder community to determine the best route to get us there."[18] India needs to leverage this opportunity for furtherance of its envisaged objectives for internet governance by formulating a coherent policy and creating a team of technocrats, diplomats and members from academia for spearheading its efforts.

18. "Administrator of Domain Name System Launches Global Multistakeholder Accountability Process", https://www.icann.org/resources/press-material/release-2014-03-14-en. Accessed on January 28, 2015.

INDIA AND THE UNITED STATES: REINVIGORATING THE 'ENERGY' RELATIONSHIP

STUTI BANERJEE

INTRODUCTION

For nearly the entire duration of the Cold War, India and the United States struggled to find common grounds on which they could base a successful relationship. The geo-political conditions prevailing during this period undermined the potential for sustained bilateral engagement. The fall of the Soviet Union opened the diplomatic arena for new collaborative initiatives between India and the United States. The Indian position was supported by the US during the Kargil War (1999). Prior to the visit by President Clinton in 2000, the US removed sanctions applied on India following its 1998 nuclear tests. The visible thaw in the relationship started when Prime Minister Atal Bihari Vajpayee famously stated that India and the United States were "natural allies".

Since 2004, the two countries have pursued a "strategic partnership" that incorporates numerous economic, security, and global initiatives. Geo-political realignments have dramatically increased India's visibility and

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In the economic sphere, India and the United States want to establish partnerships that would increase economic productivity in both countries and propel growth. They are both competitors and collaborators with China, however, both are equally suspicious of China's ambitions.

potential value in the US' security calculations, from a "growing global power with common interests" (as described in President Bush's 2002 National Security Strategy) and "the relationship as one of the defining partnerships of the 21st century, rooted in common values and interests," (as President Obama told the Indian Parliament in 2010), to a "lynchpin" of the US' strategy extending from the Western Pacific and East Asia into the Indian Ocean region and South Asia (as described in a June 2012 speech by Defence Secretary Leon Panetta). In his address to the people of India, President Barak Obama, on his second visit to India and the first by a US president as guest of honour for the Republic Day parade, said, "...India and the United States are not just natural partners.... America can be India's best partner."[1]

The partnership today is based on certain common factors that the two countries share. Within their security relations, they have similar views on regional security and the fight against non-state actors. In the economic sphere, India and the United States want to establish partnerships that would increase economic productivity in both countries and propel growth. They are both competitors and collaborators with China, however, both are equally suspicious of China's ambitions. Politically, they have a common foundation of their political system, which is rooted in democracy and the constitutional division of power.

The United States is promoting its 'rebalancing' policy for Asia in which India plays an important role as an emerging international player with a thriving political system and a stable economy. The energy relationship is one of the core elements of the strategic partnership. India and the United States have largely similar energy security concerns such as stable global energy

1. The White House, "Remarks by President Obama in Address to the People of India." Accessed on February 6, 2015, URL- http://www.whitehouse.gov/the-press-office/2015/01/27/remarks-president-obama-address-people-india

supplies, controlled prices, diversification of energy resources, promotion of renewable energy and environmental sustainability, and developing technology and investments for new sources of energy.

This paper would be a brief study of the energy relationship between the two countries, through the civil nuclear deal and renewable energy sources, as part of the larger strategic relationship they share.

Growing strategic relations between the two countries have implications for the energy relations as well. India's continued economic growth and security are intrinsically linked to energy and the secure supply of energy resources.

Growing strategic relations between the two countries have implications for the energy relations as well. India's continued economic growth and security are intrinsically linked to energy and the secure supply of energy resources. India has been developing a policy to diversify its energy resources, achieve better energy efficiency and minimise losses. For developing countries, every one per cent growth in Gross Domestic Product (GDP) requires a 1.5 per cent growth in energy supply. Major growth areas in the next 50 years will be the developing countries where economies and population are increasing rapidly. The world population will grow from 6 billion in 2000 to 10 billion by 2040. Energy demand will double and perhaps treble from its 1990 value by the year 2050. 'Clean energy', that is a mix of renewable and nuclear energy will become the way ahead.[2]

THE NUCLEAR AGREEMENT

The civil nuclear agreement or 123 Agreement[3] generated considerable interest in both India and the US. The agreement was first announced in a joint statement[4] by Prime Minister Manmohan Singh and President G.W. Bush in 2005, ending the nearly three-decade-old US moratorium on

2. Ian Fell, "Clean Energy", *RSA Journal,* vol.148, no. 5493, 2000, p.86.
3. The text of the agreement is available at URL- http://responsiblenucleartrade.com/keydocuments/india_123_agreement_text.pdf.
4. The Joint Statement by President G H Bush and Prime Minister Singh is available at URL-http://georgewbush-whitehouse.archives.gov/news/releases/2005/07/20050718-6.html.

nuclear trade with India, imposed on account of the nuclear tests conducted by India in 1974 and reinforced after its nuclear tests in 1998. The landmark agreement was signed by India and the US in 2008 and cleared by the Nuclear Suppliers Group (NSG) in 2008. It was successfully voted by the Indian Parliament and also ratified by the US Congress. The US government passed the Hyde Act (2006) to facilitate the implementation of the deal by exempting India from certain provisions of the US Atomic Energy Act (1954). The agreement provides India access to US nuclear technology and other assistance for the civilian nuclear energy programme, and expands cooperation between the two countries in energy and satellite technology. The deal also allows India to buy US dual-use nuclear technology, including materials and equipment that could be used to enrich uranium or reprocess plutonium, potentially creating the material for nuclear weapons. It would also receive imported fuel for its nuclear reactors.

Energy security is an essential part of India's national security apparatus and diversification in the energy mix is a step in that direction. Nuclear energy is an option that India has decided to explore. Despite the sanctions, Indian nuclear scientists have been able to develop indigenous technology to continue operations; however, they need to collaborate with their foreign counterparts. The deal with the US helps India to acquire new technology as also to participate in its development. Nuclear fuel is an important aspect of this deal; India still needs to import uranium to rapidly expand its capacity to generate nuclear energy. The Civil Nuclear Agreement was the centrepiece of a transformed relationship, which demonstrated new trust. It also created new economic opportunities and expanded the option for clean energy.[5]

Why did the US Sign the Deal?

The question that arises is: why did the US decide to sign the agreement, marking a sharp departure from its nuclear non-proliferation commitments? After the nuclear tests by India in 1998, it was apparent to the international

5. The White House, "Statements by President Obama and Prime Minister Modi of the Republic of India". Accessed on February 6, 2015, URL- http://www.whitehouse.gov/the-press-office/2015/01/25/statements-president-obama-and-prime-minister-modi-republic-india

community that neither did the sanctions have the desired effect nor was India willing to renounce its nuclear weapons programme. It was not in the US interest to isolate India through sanctions; rather, it was in its interest to bring India within the ambit of the rules and regulations of the International Atomic Energy Agency (IAEA) and NSG, thereby strengthening the non-proliferation regime. It was also realised that sanctions had not had the desired effect on India. The agreement is expected to lead to nuclear technology cooperation in developing safer reactors that would also be cost-effective and have higher efficiency. It is also expected to lead to greater transparency in India's nuclear sector, which will reduce the risks of proliferation, nuclear accidents, and nuclear meltdowns.

The agreement is also important for the United States' nuclear industry. On the basis of the 2008 bilateral agreement, US companies—most importantly Westinghouse and GE-Hitachi—plan to build nuclear power plants in India. A US-India trade group claims that this business may ultimately be worth US $130 billion by 2030. William J Burns, under-secretary for political affairs, gave a more modest figure of 3,000-5,000 new direct jobs and about 10,000-15,000 indirect jobs in the US if US firms won two bids for new nuclear plants in India.[6]

There was also the possibility that India might favourably view the Comprehensive Test Ban Agreement (CTBT) and Fissile Material Treaty (FMCT), the two agreements it has refused to sign due to its own security concerns. It was also anticipated that, given the depth of the relationship, the US could hope to have India's support on various international issues such as sanctions against Iran. The deal was viewed as an incentive for India to refrain from nuclear testing in the future.

Strategically, partnering with India could help the United States to reduce the cost of exercising its political, military or economic power to limit the growth of China as a possible rival. The United States policy-makers view Asia as the gravitating point that shall in the future become the centre of international politics and finance, as has been repeatedly decribed in the US'

6. Mark Hibbes, "Moving Ahead on the US-India Nuclear Deal", Carnegie Endowment for International Peace. Accessed on August 27, 2013, URL- http://carnegieendowment.org/2010/04/05/moving-forward-on-u.s.-india-nuclear-deal/25yl

For India, the deal allows it to emerge out of the cycle of decades of nuclear isolation while providing it an opportunity to reduce its energy deficit. It is one step in a series of agreements in equally sensitive areas such as defence technology, which would bring India and the US closer.

'pivot' to Asia policy. To be able to maintain a measure of influence, the United States needs strong regional partners and allies. With the widespread criticism of its invasion of Iraq and the problems it faces in Afghanistan, it needs friends and allies more than before. The US Department of State and Department of Defence hold the view that India can play a substantial role in sharing the regional security burden. Officials from both the US State Department and Defence Department agree there is a natural convergence of India's "Look East Policy" and the "Asia-Pacific Rebalance" of the US.[7]

This safeguards US interests, while allowing it to take a few steps back from active engagement. The US is conscious of the anti-US sentiments widespread in the region, with India perhaps, being the only exception. It wants to leverage India's good relations and influence to help stabilise a region which is witnessing a rise in radical politics, growing influence of non-state actors and terrorist organisations, and a relatively declining influence of the US.

Why Did India Sign the Deal?

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The deal is *de-facto* recognition of India's emergence as a nuclear weapons state, though critics claim that it does not comprise recognition in the international arena. It is also a vindication of New Delhi's self-imposed moratorium on nuclear weapons testing and a testimony to the

7. NDTV, "Stronger India is Beneficial For World Peace: US". Accessed on September 12, 2014, URL-http://www.ndtv.com/article/india/stronger-india-is-beneficial-for-world-peace-us-585519

non-proliferation record the country has been able to maintain, and its consistent stand on the nuclear Non-Proliferation Treaty (NPY), CTBT and nuclear disarmament, unlike Iran, North Korea and Pakistan.

The joint statement states, "India will have the same benefits and advantages as other leading countries with advanced nuclear weapons technology, such as the US." The deal provides India with much needed advance nuclear technology, reactor technology and, more importantly, access to fuel to power its reactors, to both sustain and expand its nuclear energy programme. Despite the best efforts of the Department of Atomic Energy (DAE), it has been unable to generate large quantities of nuclear energy and would benefit from the much needed export of technology. The other major issue crippling the DAE is the question of securing sufficient supply of uranium to fuel the nuclear reactors. India does not have vast reservoirs of uranium and in the wake of the sanctions, was unable to secure its import. Shortage of nuclear fuel would have led to a shutdown of the nuclear reactors and, by extension, the nuclear, programme. The nuclear deal is the pathway that India has followed to gain access to the international uranium market.

The deal does not curtail India's ability or the need to build for itself a "*credible minimum nuclear weapons deterrence capability***". Since India has yet to define the term 'minimum', it can, at a later date, expand the numbers in its arsenal.**

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India is aware of the pressures that are being exerted upon it to be part of the CTBT and the NPT regimes. While the deal does not curtail India from future tests, it has become increasingly difficult to do so because of existing international norms, and, more importantly, international opinion against nuclear testing. The nuclear deal could possibly have been acknowledgement of India's stand in ensuring recognition of its non-

proliferation efforts, its nuclear capacity and need for nuclear deterrence in the face of the threat from two nuclear weapon states on its borders. The deal marks the acceptance by the US of the long standing Indian demand for lifting international sanctions on India for nuclear cooperation.

The deal provides India with the opportunity to reduce its energy deficit while not compromising on its strategic sovereignty. It also provides India with an opportunity to forge a new strategic relationship with the US. By the turn of the 21st century, balancing China's growing power is becoming a strategic imperative for the US. The US views India as a possible balancer to China because of its sheer size, geography, military capabilities, industrial potential, economic strength and democratic political values. The nuclear deal can provide the edifice for a robust security relationship between the two states centred on balancing Chinese power. However, India has made it clear time and again that its foreign policy would be influenced by its national security and interests, and would be anchored in independence.

The nuclear deal has become the centrepiece of the new Indo-US partnership, which also focusses on other issues like economic prosperity, closer military and strategic ties, intelligence sharing, and cooperation on fighting terrorism. If the nuclear deal is implemented as described on paper, it will benefit India, the US, and the countries of the NSG that engage in nuclear trade with India. However, the US and India will make strategic gains in addition to economic ones. In theory, the deal is not just between India and the US but between India and all the NSG countries. After the deal was cleared by the US Congress, India signed nuclear cooperation deals with France, Russia, and Canada. It is even free to engage in nuclear cooperation with countries like China.[8]

Challenges

While both states are keen to implement the agreement, in the past five years there has been little progress. Much of the interest that it generated has dissipated, especially among foreign policy thinkers within the two

8. Prashant Hosur, "The Indo-US Civilian Nuclear Agreement What's the Big Deal?", *International Journal (CIC)*, vol. 65, issue 2, Spring 2010, pp. 435-448 (London: Sage Publications, 2010), p.446.

countries, who feel that the agreement has failed to meet expectations. However, the recent joint statement released during President Obama's visit (January 2015), stated that the two countries are moving towards commercial cooperation, consistent with their respective laws, international legal obligations, and tactical and commercial viability. President Obama has also given assurances of US support for India's full membership of the four international export control regimes.[9] Speculations have arisen about the assurances given by the Indian government on the contentious liability issue, which had been a major concern of the US companies. The Government of India has yet to clarify about the nature of 'understanding' it has reached with the US but the news that the civil nuclear deal would be implemented soon has brought renewed interest in the relationship.

There is a number of impediments that need to be cleared for the agreement to be implemented. The Civil Liability for Nuclear Damage Bill (2010)[10] passed by the Parliament has caused a rift between the Indian entities and the US nuclear suppliers. The Bill seeks to create a mechanism for compensating victims of nuclear damage arising from a nuclear incident. The US had opposed two of the provisions that stemmed from the legislature's refusal to indemnify foreign suppliers from accidents caused by faulty equipment. Section 46, which allows ordinary citizens to file claims for damages, is seen by the US nuclear industry as exposing its companies to unlimited liability in the event of an accident. Washington's second objection is to Section 17(b), which grants Indian operators the right of recourse against nuclear suppliers if an accident results from the "supply of equipment or material with patent or latent defects or sub-standard services." It allows for the supplier to be penalised if he had accepted liability in a written contract, and limits their exposure in the event of faulty equipment to accidents which occur in the first five years of the reactor's operation.[11] India is unwilling to implement the deal without the safety factors in the liability Bill. However,

9. The White House, n.5.
10. The text of the Bill and all relevant related documents are available at URL- http://www.prsindia.org/billtrack/the-civil-liability-for-nuclear-damage-bill-2010-1042/
11. "New Rules Give Some Relief to Suppliers", *The Hindu*, November 16, 2011. Accessed on August 27, 2013, URL- http://www.thehindu.com/news/national/new-rules-give-some-relief-to-nuclear-suppliers/article2633545.ece

Given India's past experience of sanctions, questions have been raised on the reliability of the US as a supplier of raw material and technology. India has on its own accord halted but not renounced its rights to test nuclear weapons in the future.

the Attorney General of India, Goolam Essaji Vahanvati has stated that it is for the operator of a nuclear plant in India to decide whether it wished to exercise the "right of recourse" provided to it under Section 17 of the Civil Liability for Nuclear Damage Act. The attorney general's opinion effectively paves the way for the Nuclear Power Corporation of India Ltd. (NPCIL), which will operate any nuclear plant using imported reactors, to repudiate a right that Parliament explicitly wrote into Section 17(b) of the law to ensure that foreign suppliers are made liable if a nuclear accident is traced back to "equipment or material with patent or latent defects or sub-standard services."[12] His views were expressed in an opinion to the DAE query seeking clarity on the law. It is likely that the attorney general's view would be challenged by the opposition parties in the Parliament.

The US has to understand that the liability Bill has emerged as a result of India's democratic processes and also, to a large extent, the changed perceptions about the safety of nuclear energy after the Fukushima accident in Japan. Around the time the liability Bill was being debated in the Lok Sabha, the decision on the Bhopal gas tragedy was released. Almost 30 years later, the victims of this infamous industrial tragedy still suffer greatly due to lack of proper compensation and medical rehabilitation. The timing of the decision brought the disaster into the forefront of the Indian public's mind and arguably bolstered the push for strong supplier's liability.

Given India's past experience of sanctions, questions have been raised on the reliability of the US as a supplier of raw material and technology. India has on its own accord halted but not renounced its rights to test

12. Sandeep Dikshit and J. Venkatesan, "Manmohan May Carry Nuclear Liability Dilution as Gift for US Companies", *The Hindu*, September 19, 2013. Accessed on September 19, 2013, URL-http://www.thehindu.com/news/national/manmohan-may-carry-nuclear-liability-dilution-as-gift-for-us-companies/article5142882.ece?homepage=true

nuclear weapons in the future. Prime Minister Manmohan Singh in his statement to the Parliament on August 13, 2007, had made it clear, "The agreement does not in any way affect India's rights to undertake future nuclear tests, if it is necessary in India's national interest."[13] There is nothing in the agreement that legally curtails India from testing a device. According to the agreement, it can be terminated by either party for any reason with a one year's notice. It does not specifically mention nuclear testing, but the parties agreed to consider whether the triggers for cessation stem from a changed security environment or similar action by other states (i.e. a nuclear test by Pakistan). The agreement provides the US support for an Indian effort to develop a strategic reserve of nuclear fuel in order to guard against any disruption of supply for the lifetime of India's reactors. However, it is too early to predict the US behaviour in the event of nuclear testing by India. Given India's deepening nuclear ties with other countries, there is a possibility that US actions would have a modest impact. The other factor that has to be kept in mind is the strength of India and US relations. Sanctions were imposed on India during the Cold War, when the geo-political and geo-strategic needs of both countries were different; today, however, they face an entirely different international environment. There is a strong possibility that, given the depth of the relationship, the US may have limited options in the event of a nuclear test by India.

The nuclear deal is part of the strategy of India and the US to establish 'energy' as an important pillar in consolidating and strengthening their relationship. They also share similar concerns on securing energy supply lines and the cost of energy imports.

The nuclear deal was never only about India buying a few reactors from the US; the agreement was a step in the assimilation of India into the international nuclear trade and technology regimes as also a step to leverage economic, strategic and political dividends for the country. For the US, the agreement had similar benefits.

13. Prime Minister of India, Government of India "Speech—PM's Statement in the Lok Sabha on Civil Nuclear Energy Cooperation with the United States, August 13, 2007". Accessed on September 18, 2013, URL-http://pmindia.nic.in/speech-details.php?nodeid=550

The nuclear deal is part of the strategy of India and the US to establish 'energy' as an important pillar in consolidating and strengthening their relationship. They also share similar concerns on securing energy supply lines and the cost of energy imports. Both countries have a common interest in weakening the nexus among economic growth, energy demand and environmental degradation.[14] It is for this reason that the cooperation is robust in the renewable energy component as well.

INDIA-UNITED STATES RENEWABLE ENERGY COOPERATION

The United States and India are competing with each other to become the largest consumer of energy in the world, with China included in this race as well. The United States Energy Information Administration (EIA) projects that China will surpass the United States as the largest net oil importer by 2014, in part due to China's rising oil consumption, roughly between six to seven million barrels per day.[15] The *BP Energy Outlook 2014* has very similar findings. It shows global energy demand continuing to increase at an average of 1.5 per cent a year to 2035. Growth is expected to be moderate over this period, climbing at an average of 2 per cent a year to 2020 and then by only 1.2 per cent a year to 2035. Ninety-five per cent of this growth is expected to come from non-OECD (Organisation for Economic Cooperation and Development) economies, with China and India accounting for more than half of the increase. This increase in energy is across energy sources of oil, natural gas, coal and nuclear energy (China, India and Russia will together account for 96 per cent of the global growth in nuclear power). Similarly, in the renewable sector, especially hydroelectricity, India and China along with Brazil would be responsible for nearly half of the growth predicted.[16]

Energy and the need to develop sustainable and renewable sources of energy has been part of India's relationship with the United States. If

14. Vikram Singh Mehta, "Energy: A Solid Pillar Upon Which to Build India-US Relations" in *The Modi-Obama Summit; A Leadership Moment for India and the United States* (Brookings: Brookings University Press, 2014), p.49.
15. US Energy Information Agency, "International Energy Outlook 2014". Accessed on October 14, 2014, URL-http://www.eia.gov/forecasts/ieo/
16. BP Energy Outlook 2035. Accessed on October 14, 2014, URL-http://www.bp.com/en/global/corporate/press/press-releases/energy-outlook-2035.html

one were to simply study the joint statements issued at the end of each of the five India-United States strategic dialogues, energy is an important aspect of the strategic partnership that the two countries envisage to build for themselves. They have accorded "...critical importance of energy to sustaining economic growth and securing prosperity, and acknowledged the robust and full range of cooperation under the US-India Energy Dialogue, co-chaired by the Secretary of the United States Department of Energy and the Deputy Chairman of India's Planning Commission. The United States and India plan to continue their ongoing efforts to expand partnerships in clean energy and energy efficiency through the US-India Partnership to Advance Clean Energy (PACE) and under the multilateral Clean Energy Ministerial. Since 2009, PACE–Deployment has mobilised approximately USD 2 billion in clean energy financing to India and PACE–Research has created innovative public-private consortia through the USD 125 million Joint Clean Energy Research & Development Centre..... India has welcomed additional efforts aimed at financing clean energy investments, promoting the development of smart grid technologies, energy efficient buildings, solar power, smart and efficient air conditioning and space cooling, and expanding off-grid access to clean energy."[17]

The Need for Joint Cooperation

The question that needs to be answered is: why do India and the United States need to cooperate in developing clean energy?

Globally, there is a trend in renewable energy investments, currently worth US$ 244 billion. Of this, the close to 45 percent of investment in 2012 was in the developing countries which was 19 per cent higher than in 2011. India and the United States have investments worth US$ 40.5 million which accounts for about 16.5 per cent of global investments in this sector. According to Ernst & Young, India is the world's third best investment destination for renewables.

17. Office of the Spokesperson, US Department of State, "Joint Statement: Forth US-India Strategic Dialogue". Accessed on October 14, 2014, URL-http://www.state.gov/r/pa/prs/ps/2013/06/211084.htm

The two countries are positioned to collaborate in the renewable energy sector given their already existing strategic partnership, converging energy interests, technological prowess, and the vast majority of bilateral mechanisms that allow them the opportunity of close consultation and policy coordination. Both countries can allow their technical knowhow to drive investments and innovation in affordable and efficient renewable energy technologies. The United States, private and public sector investments have an opportunity to expand their foothold in India in the solar energy sector. India allows 100 per cent foreign direct investments in renewable energy generation and distribution and is a favourable case for solar energy. The United States has taken advantage of this and nearly 40 per cent of India's first 1,000 MW of installed solar power was financed in partnership with the Overseas Private Investments Cooperation, Export-Import Bank of the United States, US Agency for International Development (USAID), US Department of Commerce and US Trade and Development Agency.[18]

Both India and the United States have recognised that climate change is an important challenge which cannot be overcome until countries cooperate with each other. Climate change problems and consequences are not restricted to the territory of only one country but affect humanity as a whole. Thus, the solution also needs to be international in nature. However, domestic compulsions are driving the policies of the two countries. The United States' domestic resistance has often prevented steps from being taken such as the recent 30 per cent reduction plans, as proposed by President Obama. In India, the pressures are on increasing access and meeting the already growing demands, which are also linked to economic development. In such a situation, India is not in a position to accept binding targets and penalties. Nonetheless, the business as usual attitude would need to be dispensed with and new solutions in terms of technology and energy services and management have become critical.[19]

18. Vineeth Atreyesh Vasudeva Murthy, *India's Solar Energy Future* (Washington DC: Centre for Strategic and International Studies, 2014), pp.1,3.
19. Rahul Tongia, "India-US Energy Cooperation", in *The Modi-Obama Summit: A Leadership Moment for India and the United States* (Brookings: Brookings Institute Press, 2014), p.53.

The United States and India are also aware that they have divergent views on the role that the developed and the developing economies of the world have in achieving emission norms. Close cooperation would help both nations to understand each other's compulsions better while working towards an economy that doesn't grow at the cost of the environment. It could also bring the two countries to agree to and advocate for, certain global environmental/ climate change related norms.

Renewables have become increasingly essential for the 'energy portfolio' of all countries, not only for protecting the environment but also for diversifying their energy resources for long-term energy security. As resources become scarce and prices increase, renewables become an important aspect of the economic sustainability calculations of countries.

While energy security is not just restricted to supply of raw material, but also includes expansion and security of electricity infrastructure systems, repel attacks on production structures, and proper transmission and distribution, for this paper, it is limited in scope to security of supply of fuel. For India, the economic development that it wants needs significant growth in its energy supply: in such a situation, renewables can provide alternative, and usually indigenous, sources of electric power, allow the diversity of electricity sources through local generation, and contribute to the flexibility of the energy sector, and provide resistance to central shocks. Renewables can reduce geo-political security risks by contributing to fuel mix diversification. Their risks are different from those of fossil fuel supply, and they can reduce the variability of generation costs. In addition, indigenous renewables reduce import dependency.[20] Thus, renewables have the potential to not just contribute to energy security but also to assist in achieving environmental objectives on the national, regional and global levels.

According to the "Vision Statement for the Strategic Partnership"[21] released during Prime Minister Modi's visit to the United States, American

20. Samantha Ölz, Ralph Sims and Nicolai Kirchner, *Contribution of Renewables to Energy Security* (Washington DC: International Energy Agency, 2007), pp. 7,9,11.
21. Office of the Press Secretary, The White House, "US-India Joint Statement". Accessed on October 1, 2014, URL-http://www.whitehouse.gov/the-press-office/2014/09/30/us-india-joint-statement

As per the 12th Five-Year Plan, the future expansion in power generation capacity in India is planned around 88GW. In order to meet this capacity, investment in the the transmission sector needs to be increased.

industry is keen to be the lead partner in developing smart cities in Ajmer (Rajasthan), Vishakhapatnam (Andhra Pradesh) and Allahabad (Uttar Pradesh). The cooperation should be to build smart but sustainable cities that implement binding energy efficiency standards and regulations, proper distribution infrastructure. India and the United States need to pool in their expertise on technologies and policy regulations and exchange knowledge on the implementation of just projects.

The United States has extensive technological expertise in building smart grids, which are more robust and better suited for renewables produced energy. A smart grid means "computerising" the electric utility grid. A key feature of the smart grid is automation technology that lets the utility adjust and control each individual device or millions of devices from a central location. USAID is supporting the Government of India in monitoring and implementing the US$ 150 million worth 14 smart grid pilot projects that have been initiated by the Ministry of Power. At the same time, the US Trade and Development Agency is working with the private sector to support smart grid development. Cooperation in this area would be beneficial, as the average loss in Transmission and Distribution (T&D), according to the Ministry of Power is 23.65 per cent (2011-12). As T&D loss is not able to account for all the losses in the network, losses are also calculated on the basis of Aggregate Technical and Commercial (AT&C) losses, which are considered to be a better indicator of total losses in the system. Technical losses are inevitable and are due to flow of power in the transmission and distribution system. However, in India, the commercial losses, due to theft of electricity, faulty meters, misuse of power, etc are very high. According to the Ministry of Power report, AT&C losses are at 27 per cent (2011-12).[22] Private organisations

22. Central Electricity Authority Ministry of Power, Government of India, "Executive Summary Power Sector February-2014". Accessed on October 13, 2014,URL- http://www.cea.nic.in/reports/monthly/executive_rep/feb14.pdf

that have commissioned similar reports give considerably higher figures.

As per the 12th Five-Year Plan, the future expansion in power generation capacity in India is planned around 88GW. In order to meet this capacity, investment in the the transmission sector needs to be increased. Overall, an addition of 90,000 ckm of 765-220 kV lines, 154,000 MVA of sub-station capacity and 27,350 MW of national grid capacity is required in order to meet the 12th Five-Year Plan. For this purpose, an investment of US$ 35 billion is planned in the power transmission sector. Of this, about US$ 19 billion is planned to come from the Power Grid Corporation of India Limited. The remaining US$ 16 billion, or 46 per cent of the total investments, needs to be secured from private players.[23] In an interview to *The Economic Times*, Minister for Power, Coal and Renewable Energy Mr. Piyush Goyal said that the Indian government is "...looking for investment of US$100 billion in the next five years".[24] India is open to the United States' investments in not just infrastructure but also technology.

The United States has considerable expertise in storing energy via pumped hydropower which is rare in India. Yet this method is cost-effective and highly efficient and could be an area for cooperation.

Collaboration is required in research and development in all aspects such as supply, storage, conversion, consumption. The United States has considerable expertise in storing energy via pumped hydropower which is rare in India. Yet this method is cost-effective and highly efficient and could be an area for cooperation. Areas of new cooperation also include new technology for insulations, batteries, high energy efficiency products, etc.[25]

23. FICCI, "Power Transmission The Real Bottleneck: An Overview of the Indian Power Transmission Sector, Its Challenges, and Recommendations". Accessed on October 13, 2014, URL-http://www.ficci.com/spdocument/20311/power-transmission-report_270913.pdf, p.02
24. Anindya Upadhyay, *The Economic Times*. Accessed on October 20, 2014, URL-http://articles.economictimes.indiatimes.com/2014-09-19/news/54108858_1_piyush-goyal-renewable-energy-energy-minister
25. Tongia, n.19, p.54.

The other main reason for collaboration would be the economic benefits. Renewables could be used to provide electricity to smaller household units that make the setting of large scale transmission and distribution systems financially ineffective. Electrification could also help in the health and education sectors in the rural areas. Collaboration could also infuse new players into the renewables industry and also help in innovation of technology by Non-Governmental Organisations (NGO), start-ups, small scale enterprises, etc. These small businesses and innovators require government assistance. The renewable energy industry is a principal supplier of technologies that make the global economy less reliant on non-renewable fossil fuels by producing a wide range of new, innovative products and services, and by continuing to reduce costs to make new and existing technologies cost competitive. Increased investments in the renewable energy sector would also lead to such dividends as job creation, economic growth along with energy security and insulations for oil price shocks.

Challenges for Green Energy

The challenges that the renewable energy sector faces are in the form of "green protectionism" which covers two types of trade barriers: tariff and non-tariff. Under the former, a country taxes imported wind, solar or other renewable parts or units. In India, for example, renewable energy components are levied a 7.5 percent tariff. Under non-tariff barriers, overseas companies have to set up joint collaborations with local companies. Currently, the US Trade Representative Michael Froman has filed a case against India in the World Trade Organisation stating that Indian policies ensure that Indian solar developers use locally made equipment, discriminating against US producers.

The other is the competing cost of other sources of energy. Coal and oil based thermal power is preferred over renewables due to its short gestation period, marginal physical displacement of people and pressure of donor agencies. The high initial costs, the generally slow build up of loads and high transmission and distribution losses of conventional energy production

and utilisation were accepted as a trade-off in centrally planned public sector operations. Although subsidies and financial incentives were given liberally to the renewables sector and its technology development, they remained marginalised in the overall energy scenario. The total investment in renewables has to be increased and the source of energy popularised. The larger the demand for renewables, the more investments would be attracted by the sector and the cheaper they would become. It has to be pointed that while the initial cost of renewable energy may be higher, in the long term, or in the life cycle cost, it is cheaper. The environmental costs also add to its benefit. However, government subsidies and dependency on non-renewables ensure that renewable technology continues to cost more.

What has compounded the problem for renewables is the very fact that they were initially subsidised. Now there is an expectation that they will comprise subsidised power only. In India, power tariffs are highly underpriced and subsidised, especially for the rural sector and in some notified industrial areas. While considering the cost benefits of renewables, such direct subsidy on the cost of power and indirect subsidy by way of subsidy on freight and coal are never calculated, hence, conventional power costs are always more attractive and affordable than those of renewable power.

There is no legislation in India which deals exclusively with renewable energy. This sector is governed by the provisions of the Electricity Act, 2003[26] which is the principal statute governing the electricity sector in India.

Another main barrier as perceived by some is the government policy. To popularise and promote renewables, nodal agencies were set up in each state. In addition, the government has set up rigid guidelines for equipment to be eligible for a subsidy. This has led to the formation of a closed circle in manufacturing with a few manufacturers cornering the entire market. In the name of "standardisation" and "registration", innovation has been totally crippled and even if we search, we are not likely to get low cost or cheap renewable resources. For example, unless supplied by the government, an

26. Details of the Act can be accessed at URL-http://powermin.nic.in/acts_notification/electricity_act2003/preliminary.htm

NGO, or a voluntary agency, it is almost impossible to find a poor household making use of solar water heating systems or solar cookers.

There is a multiplicity of departments that look after renewables. There is duplication, overlapping and lack of coordination in the implementation of renewable energy programmes. A bureaucratic structure with a target oriented approach has led to rigidity in instructions and a centralised planning process is virtually choking the growth and spread of this source of energy.

Another barrier to growth and popularisation of renewables is that there is no university offering an exclusive degree/diploma course in the subject. Even in schools and at homes, environment and renewables are not given due importance or acceptance.[27]

India and the United States can collaborate on renewable energy sources through the various institutions and dialogue processes that they have already set up. Energy cooperation, especially in renewable energy, would also not attract political opposition. In fact, the close working relationship would help build trust and friendship that would help dissipate the misgivings that have been a part of the relationship.

CONCLUSION

As India and the United States move to explore 'non-traditional paths' to strategy, energy security has become paramount. Ample energy is a prerequisite not just for economic growth but a requirement for the overall development of any country – for its stable political environment, strong social growth, economic development and robust defence. Thus, an energy strategy is parallel in importance to the economic strategy and military strategy.

The current Indian strategy involves diversification. India is a net importer of energy resources from very volatile regions of the world, the transportation of this precious resource is through piracy affected sea routes and the burden on the exchequer is enormous. In such a situation, it

27. Renewable Energy Occasional Paper Series, "BARRIERS? To Renewable Energy Development in India". Accessed on October 23, 2014, URL-http://www.climateparl.net/cpcontent/Publications/RE%20Occasional%20Paper%202%20Barriers%20in%20India.pdf

is imperative for India to explore and employ all energy options available to it. And to build a strategy for energy that would project long-term recommendations that would enhance our security and advance prosperity, while protecting the environment.

For India, two significant developments in Asia are helping it in evolving its strategic contours and its security concerns One is China's rise in the Asia-Pacific region, and the other is the United States' policy towards Asia. We have to learn from the example of China, which is establishing relations with countries across the world to secure energy resources for the future. Energy diplomacy is now part of India's strategic thinking through diversification and overseas acquisitions. India's energy outreach also has broader foreign policy benefits as it helps India advance its influence and establishes it as a global investor in international peace and stability.

Unlike in the case of China, the United States views India as a longer term partner rather than a challenger. In explaining the "shift in its pivot" President Obama stated, "With most of the world's nuclear power and some half of humanity, Asia will largely define whether the century ahead will be marked by conflict or cooperation, needless suffering or human progress."[28] Within this strategy, then Secretary of State Hillary Clinton had stated, "India's greater role on the world stage will enhance peace and security, that opening India's markets to the world will pave the way to greater regional and global prosperity...."[29]

India and the United States are committed to enhancing energy cooperation due to the central role energy plays in a wide range of priority issues – from climate change and energy security to energy access, economic growth, trade and investment as well as in strengthening security and military cooperation, boosting economic growth and cooperation on various regional and global issues.

28. Office of the Press Secretary, The White House, "Remarks By President Obama to the Australian Parliament", November 17, 2011. Accessed on October 14, 2014, URL- http://www.whitehouse.gov/the-press-office/2011/11/17/remarks-president-obama-australian-parliament
29. Hillary Clinton, "America's Pacific Century", *Foreign Policy November 2011***.** Accessed on February 05, 2015, URL- http://foreignpolicy.com/2011/10/11/americas-pacific-century/

INDIA-US NUCLEAR PACT: HOW STRATEGIC PARTNERSHIP GOT ENTANGLED IN DOMESTIC POLITICS

POUJENLUNG GONMEI

INTRODUCTION

The Modi-Obama diplomacy that announced the breakthrough to the nuclear pact logjam has a similarity with the Bush-Singh 2005 Joint Statement and the Rice-Mukherjee diplomacy which inked the 123 Agreement in 2008. After diplomatic breakthroughs, all of them left the nuclear issues in the hands of their domestic constituencies. As a result, the nuclear pact which envisaged a strategic partnership, was approved by their domestic constituencies but it later got entangled in the reemergence of divergent domestic politics. The Modi-Obama summit agreement to set up a "risk-transfer" insurance pool and the waiving of the intrusive inspection requirement has not ruled out the leveraging role of domestic politics. As in 2008, the two leaders have left the onus of operationalising the agreement to domestic players again. While the US has left it to its nuclear industries, General Electrics and Westinghouse, Modi agreed to let India's domestic insurance companies, led by General Insurance Company of India (GIC Re), fund the insurance pool.[1]

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1. Frank Jack Daniel and Douglas Busvine: "'We Have a Deal' - Insurance May Unlock India-US Atomic Trade," *Reuters*, Sunday January 25, 2015, http://in.reuters.com/article/2015/01/25/india-obama-nuclear-idINKBN0KY0U520150125. Accessed on January 26, 2015.

Diplomacy and domestic politics have shaped the contours and trajectory of the India-US nuclear pact.

Diplomacy and domestic politics have shaped the contours and trajectory of the India-US nuclear pact. While structural balancing compulsions provided convergence of interests and gave them diplomatic breakthroughs, the reemergence of hawkish domestic politics hindered agreement. The Modi-Obama diplomacy, however, eventually overcame the hawkish domestic preferences, nuclear suppliers' liability and intrusive inspection issues. This paper examines the prospects of executing the civil nuclear pact, a critical issue which had besieged India-US relations for nearly four decades. First, how did their domestic politics stall the nuclear pact? Second, to what extent could implementation of this nuclear pact reinvigorate their troubled strategic partnership? Third, what were the driving forces behind the Modi-Obama diplomacy that resolved the intractable domestic issues to salvage the nuclear agreement?

HISTORIC AGREEMENT

India-US relations witnessed the height of their bilateral diplomacy in the 2005 Joint Statement, which declared India as a state with advanced nuclear technology and promised it full civil nuclear cooperation for its non-proliferation credentials. It promised benefits and advantages similar to those provided to a nuclear Non-Proliferation Treaty (NPT)-nuclear weapon state. It also enjoined upon India to further undertake non-proliferation responsibilities. Accordingly, after three years of negotiations, the two countries signed the nuclear pact in 2008, also known as the 123 Agreement. The nuclear pact signalled the arrival of the "natural allies"[2] and the strategic partnership envisaged in the Next Step in Strategic Partnership (NSSP). The nuclear pact effectively overturned the "nuclear apartheid" and the sanctions imposed by the US-initiated non-proliferation regime. It has opened opportunities for India to be admitted into the Nuclear Suppliers Group (NSG).

2. Prime Minister Atal Behari Vajpayee referred to the post-Pokhran India-US ties as "natural allies" during his visit to the US on September 7, 2000. This was preceded by the Strobe Talbot and Jaswant Singh dialogues between 1998 and 2000 which dwelt on issues pertaining to the nuclear tests and sanctions. This was soon followed by the 2004 Next Steps in Strategic Partnership.

Two years later, the nuclear pact itself and the strategic partnership got entangled in their divergent domestic politics. Differences over India's liability law, the Civil Liability for Nuclear Damage Act (CLNDA) 2010, and the US intrusive fuel tracking demand stalled the nuclear deal. Besides these issues, other differences also cropped up in the areas on which the countries had agreed upon to work together as strategic partners. India's decision to acquire the French Rafael fighter planes, rejecting the US Boeing Super Hornet and Lockheed Martin fighter planes in a defence modernisation deal worth $10 billion to acquire 126 Medium Multi-Role Combat Aircraft (MMRCA) caused another deep wedge.[3] India and the US confronted differences at the World Trade Organisation (WTO) Trade Facilitation Agreement negotiations until this was resolved in November 2014. India and the US confronted policy differences over India's insistence on subsidy for its food security policy. Although both are victims of terrorism, the US policy on terrorism diverged from that of India in the Af-Pak sector.[4] The diplomatic row over the arrest of Devyani Khobragade in 2013 pushed ties between the two countries down to one of the lowest points since the euphoria of the 2005 Joint Statement.

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GREAT EXPECTATIONS

Three developments increased the expectations of the Modi-Obama summit diplomacy to address the nuclear imbroglio. One, the Bharatiya Janata Party

3. India's decision to opt for the French fighter planes caused much policy ripples in the US in 2012. US officials were disappointed at India's decision to give preference to technical issues rather than strategic gains. The French aviation company Dassault and the Government of India are facing differences over the status of the 108 aircraft which are to be manufactured in India.
4. While the US extradited the Taliban leader Latifullah Mehsud who was in its custody in Afghanistan to Pakistan in December 2014, India's request for extraditing David Headley for his complicity in the 26/11 terrorist attacks in Mumbai had been turned down by the US. India sees this refusal by the US as an anomalous stand of the US on combating terrorism and has raised questions on the US commitment to the war against terror.

(BJP)-majority government replaced the Congress-led United Progressive Alliance (UPA) coalition government that later renegaded on its nuclear pact commitment. Two, the BJP government which centred around the charismatic personality of Narendra Modi, also replaced the Advani-BJP group that had raised objections to the nuclear pact. Three, the projection of the existence of 'chemistry' and warm personal relations between Modi and Obama after their first meeting in September 2014. These events helped to remove the domestic political obstacles that could come in the way of the nuclear pact.

Notwithstanding Modi's recent persona non-grata status in the US until 20013, the two leaders went on to build strong personal relations. Modi's high-profile visit to the US in September 2014 had been reciprocated by Obama's second visit to India. Their subsequent meetings in Myanmar, Japan and Australia at multilateral interactions increased these expectations and the scope to resolve the nuclear imbroglio. Eventually, the Modi-Obama diplomacy resolved the knotty issues in which the nuclear pact was entangled by addressing, the safeguards and liability issues.

Symbolically, Modi's invitation to Obama for the second visit is a reiteration of India's traditional foreign policy choice of strategic autonomy, and a major diplomatic statement intended to square off the two visits by President Vladimir Putin to India.[5] Geo-politically, this summit diplomacy and the operationalisation of the nuclear deal were important to the US to show that it can effectively replace Russia, India's Cold War era strategic partner, and help balance the emerging China as India's new strategic partner. Do Modi and Obama have the potentials to meet these surging expectations? A look at the interfaces between their geo-political interests and domestic politics becomes imperative to determine the fate of the nuclear deal and their strategic partnership.

5. US expressed its unhappiness at the 20 agreements signed between India and Russia during the visit of Vladimir Putin to India in December 2014. Jen Psaki, spokesman for the State Department stated that it was not time for conducting "business as usual with Russia". Putin was accompanied by the Crimean Premier Sergey Aksyonov who is in the sanctions list of the US and the EU for his role in the accession of the Ukrainian Crimea region to Russia in 2014.

THEORISING INTERNATIONAL COOPERATION

The structural realist theory specifies that the behaviour of states would be primarily shaped by the compulsions of structural anarchy and domestic political preferences would be subservient to it. [6] This simplified Waltzian realist theoretical assumption confronts an anomalous situation in the India-US nuclear agreement. Empirical evidence suggests that India-US relations have been determined by the close interplay between structural compulsions and domestic preferences. If structural balancing politics and domestic-origin normative aspirations located them in opposite camps for the greater phase of their relations, domestic politics currently held sway in pushing them away from each other, particularly after the 123 Agreement was inked.

Robert D. Putnam's Two-Level Games Model (TLGM), an International Relations (IR) theory of negotiations explains that international cooperation takes place when states share overlapping interests or win-sets.[7] When states do not share overlapping win-sets, agreement is not possible. Win-sets are the sets of diplomatic agreements which are ratified by domestic constituencies for cooperation to take place. According to Putnam, the tentative international agreement arrived upon by the political leaders of the country must be ratified by the legislature of the respective country. Hence, a win-set size is a critical factor in negotiations. While a large win-set enables cooperation, a smaller win-set provides bargaining leverage. When an agreement is not ratified, a negotiator is said to have committed defection. It is an involuntary defection when its legislature fails to ratify the agreement. On the other hand, it is a voluntary defection if it is rejected by the diplomats.

The 2008 nuclear pact had been stalled due to the unprecedented liability obligations imposed on the nuclear suppliers by India's CLNDA and the US' insistence on intrusive inspection under the end user verification clause of its Atomic Energy Act. Theoretically, the failure of the UPA government and Obama Administration to implement the nuclear pact is an indication of the defection in the TLGM. Yet, the continuity of the nuclear dialogue

6. Kenneth N. Waltz: *Theory of International Politics* (Berkeley: University of California, 1979).
7. Robert D. Putnam, "Diplomacy and Domestic Politics: The Logic of Two Level Games", *International Organization*, vol. 42, no.3, Summer 1988, pp.427-460.

The 2008 nuclear pact had been stalled due to the unprecedented liability obligations imposed on the nuclear suppliers by India's CLNDA and the US' insistence on intrusive inspection under the end user verification clause of its Atomic Energy Act.

by Modi and Obama and the subsequent agreement to implement it suggests Indian and US interests retain convergence of interests. So this paper examines how shared interests and the negotiations at the diplomatic and domestic levels led to the nuclear pact.

BIPARTISAN CONGRESS AND LOK SABHA'S TRUST VOTE

This section shows how converging interests led to the nuclear pact between India and the US. While the win-set of the US is larger due to its larger strategic, commercial and non-proliferation interests, India's win-set is restricted and ambivalent due to domestic political pressures.[8] As a result, domestic negotiations in the US saw a cautious Congress extend its bipartisan support.[9] Congress expected strategic, non-proliferation and economic benefits through the nuclear pact. India's win-set was smaller because it was averse to the China-containment strategic balancing role that the US had envisaged for it. Further, it saw practically no commercial and employment promises to sell to the domestic constituencies. Additionally, the UPA government encountered stiff political resistance from the left parties within its coalition allies. Notwithstanding this resistance, the Lok Sabha Trust Vote on July 22, 2008, finally closed the deal. Thereafter, India and the US worked together at the International Atomic Energy Agency (IAEA) and the NSG to pursue the nuclear pact.

8. Condoleezza Rice, *No Higher Honor: A Memoir of My Years in Washington* (New York: Crown Publishers, 2011); Ashley J Tellis: "Kick-Starting the US-Indian Strategic Partnership" Carnegie Endowment for International Peace, Washington DC, September 22, 2014, http://carnegieendowment.org/2014/09/22/kick-starting-u.s.-indian-strategic-partnership. Accessed on January 20, 2014.
9. Dick Lugar: "United States-India Peaceful Atomic Energy Cooperation and US Additional Protocol Implementation Act", Report of the Committee on Foreign Relations, 109th Congress Report, Senate 2nd Session 109-288. (Washington DC: US Government Printing Office, 2006)., accessed on February, 21, 2012, (2006). Joe Biden: "US-Indian Nuclear Energy Cooperation Security and Nonproliferation Implications" US 109th Congress, Session 1st, Senate Committee on Foreign Relations, November 2, 2005 (Washington DC: US Government Printing Office, 2005).

American strategic experts and business lobbies convinced Congress to look at the 123 Agreement beyond economic and non-proliferation gains – also as an agreement with vast strategic benefits.[10] The Hyde Act, the deal-enabling Act, was, however, passed with certain non-proliferation riders. Most prominent among them are Sections 103 and 104 which prohibited nuclear tests, included restrictions on transfer of fuel Enrichment and Reprocessing (ENR) technology and heavy water, and gave the US president the right to ask for the return of the US supplied nuclear fuel and materials in the event of nuclear tests by India.

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In the Lok Sabha, the UPA government's motion for the nuclear pact under the 123 Agreement won the trust vote on July 22, 2008, but it turned out to be a pyrrhic political victory. Since the 2005 joint statement, the trajectory of nuclear negotiations in India moved in opposite ways from that of the course in the US. While the Bush Administration and Congress concurred with each other to extend bipartisan support to the nuclear agreement, the political parties in India responded to the nuclear deal on ideological and partisan lines. The left parties, a coalition ally in the UPA government consisting of 54 Members of Parliament (MPs), withdrew their support to the government, to join the anti-nuclear deal protests along with the BJP. Due to these divergent domestic pressures, the UPA government could not implement the nuclear pact.

10. Ashton B. Carter, "US-Indian Nuclear Energy Cooperation Security and Non-proliferation Implications", *US 109th Congress, Session 1st, Senate Committee on Foreign Relations*, November 2, 2005 (Washington DC: US Government Printing Office, 2005); Ashley J. Tellis,: "India as a New Global Power" in Ashley J. Tellis, Robert D. Blackwill and S. Enders Wimbush, *India as a Global Power: An Action Agenda for the United States* (Washington DC: Carnegie Endowment for International Peace, 2005); Bruce R. Josten: "Letter to Congress Supporting the U.S.-India 123 Agreement", US Chambers of Commerce, October 1, 2008: http://www.uschamber.com/issues/letters/2008/letter-supporting-us-india-123-agreement. Accessed on March 19, 2011

IAEA SAFEGUARDS AND NSG WAIVER

As much as the India-US nuclear pact was driven by a convergence of the win-set in the strategic, commercial and non-proliferation areas, India's safeguards agreements with the IAEA and NSG were also driven by a similar convergence of interests. Besides the India-US bilateral agreement, the nuclear pact also received the affirmative resolutions of the IAEA and the NSG in 2008.[11] While the IAEA's support was relatively easier to secure, the NSG's "clean waiver" became difficult due to the domestic politics of the "Group of Six", a group of NSG countries with non-proliferation views divergent from those of the US. The stand of the "Group of Six" countries essentially was a reflection of their domestic political parties' preferences, that insisted on NPT membership as the criteria for the NSG waiver. For instance, Phil Goff, New Zealand's minister for disarmament and arms control, depended on the support of the left-green parties to be in power.[12] Reflecting their coalition partners' opinion, opposition to a nuclear pact with India, a non-NPT state, the Group of Six delayed the consensual waiver at the NSG.[13]

Adding to this domestic politics-induced fractured opinion within the NSG, China's fear of a shift in the Asian balance of power encouraged the NSG divide. China, wary of any emerging strategic partnership between India and the US, issued varying statements on the NSG nuclear waiver and strengthened the "Group of Six".[14] It took heavy-lifting diplomacy from George Bush to change the hardline position within the "Group of Six".[15]

11. Mohammed El Baradei, "Press Statement on Board of Governor Approval of India Safeguards Agreement", *IAEA*, Vienna, (2008), http://www.iaea.org/newscenter/news/2008/brief010808.html. Accessed on May 22, 2012.; Indrani Bagchi: "India Enters Nuclear Club After High-Voltage Diplomacy", *The Times of India*, September 7, 2008, New Delhi, http://timesofindia.indiatimes.com/world/europe/India-enters-nuclear-club-after-high-voltage-diplomacy/articleshow/3452272.cms? Accessed on June 7, 2012.
12. Indrani Bagchi, "NSG Members' Domestic Compulsions Made it Tough", *The Times of India*, September 7, 2008, New Delhi, http://timesofindia.indiatimes.com/world/europe/NSG-members-domestic-compulsions-made-it-tough/articleshow/3453729.cms?. Accessed on May 7, 2012.
13. Wade Boese, "US-Indian Nuclear Deal Reaches NSG Brink", *Arms Control Association,* 2008, http://www.armscontrol.org/act/2008_09/USIndia. Accessed on July 13, 2012.
14. Chris Buckley, "China State Paper Lashes India-US Nuclear Deal", *Reuters*, Beijing September 1, 2008, http://in.reuters.com/article/2008/09/01/idINIndia-35260420080901. Accessed on May 26, 2013,
15. Bagchi, n.12.

Outnumbered, China, reconsidering its own nuclear commercial interests, consented to the waiver.[16] Subsequently, at the second session held on September 6, 2008, the NSG finally agreed to issue the "clean waiver" for nuclear commerce with India, an NPT state with nuclear weapons.

For the IAEA safeguards agreement, India fulfilled the safeguards requisites with the announcement of the Separation Plan in May 2006. This was approved by the IAEA in June 2007.[17] Further, the Additional Protocol signed in 2009 was ratified by Narendra Modi's government in June 2014.

ENTANGLED 123 AGREEMENT

This section shows how the nuclear pact got entangled. India's smaller win-set caused the nuclear negotiations and the nuclear pact to get entangled in its hawkish domestic politics. A series of events in India, the US and the NSG countries led to the nuclear pact getting entangled in hawkish domestic political positions. Criticisms about disparity in benefits, tenability of nuclear energy, limitations of the Light Water Reactors (LWRs) technology and strategic issues had been noted even before the nuclear pact was sealed in 2008.[18] These issues became sufficient factors to weigh down the UPA government from implementing the nuclear deal with the return of the 1984 Bhopal Gas Tragedy case in 2010, during the framing of the nuclear damage liability law. The protracted litigation induced India to pass the CLNDA in 2010. This was soon followed by the 2011 NSG's new guidelines which effectively reversed the 2008 NSG's "clean waiver". The 2008 NSG's "clean waiver" had earlier exempted India from the full-scope nuclear safeguards requirement for nuclear commerce.

16. In 2007, as the 123 Agreement negotiations were being undertaken, India's negotiators led by Anil Kakodkar went to China seeking nuclear fuel for India's nuclear power reactors. This move by India showed to the U.S and China that the nuclear agreement would benefit not only the U.S. but also China as a member of the NSG once the NSG waiver for full-fledged nuclear commerce was put in place.
17. El Baradei, n.11.
18. L.K. Advani, "Deal is Anti-People," Speech of L.K Advani in the Lok Sabha on the vote of confidence on July 21, 2008", in Prabhat Jha, ed. *Indo-US Nuclear Deal: Why does BJP Oppose it?* (New Delhi: Bharatiya Janata Party, 2008); Prakash Karat, *et al:* "Implications of the Hyde Act for the 123 Agreement and for Self-Reliance in the Nuclear Sector: The Impact of U.S. National Laws on the 123 Agreement", in *Left Stand on Nuclear Deal: Notes Exchanged in the UPA-Left Committee on India-US Civil Nuclear Cooperation* (New Delhi: Hari Singh Kang, 2008).

First, although the 2008 nuclear pact had benefits for both countries, the immediate benefits were skewed in favour of the US. Nuclear negotiations and domestic debates in India and US revealed that the nuclear pact had comparatively less benefits for India.[19] While the US stood to gain strategically as well as commercially, India's gain was normative and economically marginal, other than the lifting of the "nuclear apartheid", and nuclear commerce with the NSG.[20] For the US, commercially the deal promised big gains. The International Trade Administration, US Department of Commerce, estimated the deal to be worth at least $100 billion.[21] Further, the deal was projected as having the potential to create thousands of highly skilled jobs for Americans over the next few decades.[22] Other than the lifting of the sanctions and resumption of nuclear commerce, including dual-use technology, the UPA government failed to project similar economic benefits or employment opportunities for India. Instead, it projected the nuclear pact as a move to secure energy security, sustain the growth rate and reduce dependence on costly oil import and polluting fossil fuel.[23] After the Fukushima nuclear meltdown in 2011, the

19. Prakash Karat, "Press Statement of Prakash Karat, General Secretary, Communist Party of India (Marxist)", Communist Party of India (Marxist), 11, 2007, http://www.cpim.org/content/prakash-karat-pms-statement. Accessed on December 12, 2012; Advani, n.18.
20. Fareed Zakaria, *The Post-American World* (New York: W. W. Norton & Company, 2008).
21. Justin Rathke, "Growing Prospects for Sales of Civilian Nuclear Technology to India", International Trade Administration, Department of Commerce, United States of America, (2007): http://trade.gov/press/publications/newsletters/ita_0207/india_0207.asp#continues. Accessed on February 10, 2015.
22. Jeffery T. Bergner, "A Reply to Concerning Congressional Review of the Recently Initialed US-India Agreement for Peaceful Nuclear Cooperation (the 123 Agreement: Questions for the Record submitted to Assistant Secretary Bergner by Chairman Tom Lantos", House Committee on Foreign Affairs, October 5, 2007 (Washington DC: United States Department of State, 2008); Bruce R. Josten, "Letter to Congress Supporting the US-India 123 Agreement", US Chambers of Commerce, October 1, 2008, http://www.uschamber.com/issues/letters/2008/letter-supporting-us-india-123-agreement. Accessed on March 19, 2011; Ron Somers, "The Way Forward: A Bright Horizon", *USIBC Report 2007-2008* (Washington DC: USIBC, 2008).
23. Manmohan, Singh, "PM's Statement in Parliament on Civil Nuclear Energy Cooperation with United States", *Prime Minster of India: Dr Manmohan Singh, Speeches*, February 17, 2006, http://pmindia.nic.in/speech-details.php?nodeid=47. Accessed on June 2, 2012; Manmohan Singh: "PM's Statement in Parliament on Civil Nuclear Energy Cooperation with United States", *Prime Minster of India: Dr Manmohan Singh, Speeches*, February 27, 2006, URL: http://pmindia.nic.in/speech-details.php?nodeid=47. Accessed on June 2, 2012; Singh, Manmohan: "Statement of PM in Rajya Sabha on the India-US Nuclear Agreement", *Prime Minster of India: Dr Manmohan Singh, Speeches,* August 17, 2006, http://pmindia.nic.in/speech-details.php?nodeid=355. Accessed on February 8, 2013.

Congress Party virtually changed its approach to the nuclear pact.[24] The UPA government could not furnish tangible benefits for the common people of India for the nuclear pact to proceed further.

Second, the left parties and the BJP revealed the various limitations of the American LWRs. LWRs have been shown to have technological compatibility issues with India's three-stage nuclear programme. They pointed out that nuclear energy cannot be made central to India's energy security policy because of its prohibitive cost. According to the left parties' notes, which were presented at the UPA-Left Parties Committee meetings, electricity from imported reactors would be expensively priced between Rs. 4.60 to Rs 5 per unit. On the other hand, power from coal-fired power stations would be more economically priced between Rs. 2.20 to Rs. 2.60 per unit.[25] Further, they noted that energy from LWRs is more expensive than that from the domestic Pressurised Heavy Water Reactors (PHWRs). They estimated that one Megawatt (MW) of nuclear energy from LWRs would cost about Rs. 9 crore per as against Rs. 6.2 crore per MW from domestic PHWRs. They asked why the UPA government opted for a more expensive source of energy, with all the conditions that went against the national interests.[26] The UPA government argued that the tariff of nuclear energy is cost-effective and LWRs would be useful for India's energy security. It cited a study conducted in 2005, *Economics of Light Water Reactors in India.* But the emerging people's resistance to nuclear power plants over safety and livelihood issues, gradually led to the sidelining of the nuclear pact.

India's perpetual safeguards commitment without the assurance of strategic fuel supply was another concern shared by the political parties. The left parties and India's strategic analysts termed the nuclear pact as a strategic compromise that would reduce India to the status of a "subordinate ally" of the US.[27] The BJP leaders, on the other hand, demanded that the UPA government renegotiate the nuclear deal.[28]

24. Mani Shankar Aiyar, "Mani-Talk: Calm Down. We're Welcoming a Lame-Duck President", *NDTV Opinion*, January 25, 2015, New Delhi, : http://www.ndtv.com/opinion/mani-talk-calm-down-were-welcoming-a-lame-duck-president-733562. Accessed on January 25, 2015.
25. Karat et al, n.19.
26. Ibid.
27. Prakash Karat et al, *Subordinate Ally: The Nuclear Deal and the India-US Strategic Relations* (New Delhi: LeftWord Books, 2007).
28. Advani, n.18.

Third, the Bhopal gas tragedy and its protracted litigation, forced the UPA government to make a volte-face on the nuclear pact. The UPA government passed the nuclear damage liability law in September 2010. This law, in an unprecedented move, makes the nuclear suppliers liable for any "patent and latent defect" in the nuclear materials supplied, while exempting the Nuclear Power Corporation of India Limited (NPCIL), the only nuclear operator in India. Sensing that the liability law had effectively become a deal-breaker, the Nuclear Damage Liability Rules 2011 (NDLR) were passed to limit the liability to Rs. 1,500 crore and the nuclear damage claim to 10 years.[29] By then, the law had effectively halted the nuclear pact and impaired India-US bilateral ties.

Fourth, in 2011, the NSG reversed its "clean waiver" for India. In June 2011, US Ambassador Timothy J. Roemer stated that the US "strongly and vehemently" still backed the NSG's clean waiver for India.[30] Notwithstanding this statement, the June 2011 NSG guidelines issued by the NSG Plenary Session reversed the 2008 NSG's "clean waiver".[31] The NSG's June 2011 guidelines, without naming India, asserted that for exemption from the full-scope safeguards requirement, a recipient country needed to comply with the NSG's non-proliferation requirement. In other words, a full-scope waiver would be extended only to an NPT-signatory state. Political observers in India noted that without the approval of the US, the 2011 NSG guidelines could not have been issued.

The India-US nuclear pact that had been projected as the key to the strategic partnership between the oldest and biggest democracies and a major non-proliferation gain, thus, got entangled in the divergent American and Indian domestic politics. CLNDA 2010, influenced by the anti-American

29. Ministry of Law and Justice, *The Civil Liability for Nuclear Damage Act, 2010* (New Delhi: Government of India, 2010); Department of Atomic Energy: *The Civil Liability for Nuclear Damage Rules, 2011* (New Delhi: Government of India, 2011).
30. Timothy Roemer, "US Ambassador to India Timothy J. Roemer Farewell Media Address at India Gate", Embassy of the United States, New Delhi, June 30, 2011, http://newdelhi.usembassy.gov/spr063011.html. Accessed on January 28, 2015.
31. Siddhartha Varadarajan: "NSG Ends India's 'Clean' Waiver", *The Hindu* (New Delhi), June 24, 2011, http://www.thehindu.com/news/national/nsg-ends-indias-clean-waiver/article2132457.ece. Accessed on January 5, 2015.

industries' political environment, emerged as the main impediment in implementing the nuclear pact. CLNDA's Article 17(b) puts the onus of the nuclear damage liability on the suppliers. In the event of any accident, under the right to recourse, the NPCIL, after paying out the compensation, is entitled to claim damage liability from suppliers for patent or latent defects and sabotage to the plant.[32] A reciprocal non-proliferation policy by US in not budging from the "Administrative Arrangement" issues, added to the deadlock.

Despite these setbacks, Modi and Obama see the nuclear pact as a win-win agreement for both countries. In the long run, India stands to reap the advantages of the lifting of nuclear sanctions, "phased entry" into the NSG and the non-proliferation regime, and eventual emergence as a major power.[33] During the nuclear negotiations, the US succeeded in persuading India to vote against Iran for its clandestine nuclear programme at the UN.[34] But the US failed to secure India's commitment to the China-containment strategy or obtain India's signature to any of the non-proliferation regimes from the NPT to the Comprehensive Test Ban Treaty (CTBT). Instead, it earned the non-proliferation lobby charges of non-proliferation loss.[35]

The necessary cause for the emergence of the CLNDA and the stalling of the nuclear pact can also be traced to the Hyde Act. Prime Minister Manmohan Singh, speaking to the Rajya Sabha on August 17, 2006, described Sections 103 and 104 of the Hyde Act as "goalpost shifting" and the provisions on the non-proliferation requirement as "prescriptive

32. n.29.
33. US Department of State, "Background Briefing by Administration Officials on US-South Asia Relations, March 25, 2005. *US State Department Archive*, available at http://2001-2009.state.gov/r/pa/prs/ps/2005/43853.htm. Accessed January 22, 2011.
34. Condoleezza Rice, "US-Indian Nuclear Cooperation: Security and Nonproliferation Implications Congressional Hearings", *US 109th Congress, Session 2nd, Senate Hearings*, Wednesday, April 5, 2006 (Washington DC: US Government Printing Press, 2006).
35. Robert J. Einhorn, "US-Indian Nuclear Cooperation: Security and Nonproliferation Implications", *Congressional Hearings, US 109th Congress, Session 1st, House of Representatives, House International Relations Committee, Hearings* (Washington DC: U.S. Government Printing Office, 2005).

The necessary cause for the emergence of the CLNDA and the stalling of the nuclear pact can also be traced to the Hyde Act.

and extraneous issues".[36] India pointed out that the prohibition on a nuclear test and the US' right to ask for the return of the nuclear materials and technology supplied went against the assurances of the 2005 Joint Statement. India also maintained that the domestic laws of the US should not inhibit India's sovereign right to conduct a nuclear test in its national interests due to the uncertainty of security in India's nuclear-capable neighbourhood.

Hence, the rise of hawkish domestic politics led to the adoption of the stringent nuclear liability law which, in turn, stalled the nuclear pact. India's smaller win-set was responsible for the emergence of hawkish domestic politics after the nuclear pact had been sealed in 2008. In other words, the UPA government felt India had comparatively less to lose even if the nuclear pact did not materialise immediately. India's net gains from the nuclear pact are essentially normative and strategic benefits without the pressing needs associated with economic deals.

NUCLEAR CLUB, MAJOR POWER AND STRATEGIC PARTNERSHIP

This section examines the assurances of the nuclear pact and how they have unfolded for India. India and the US share common interests or overlapping win-sets in three areas: India's membership in the NSG, India's rise as a major power and the forging of an India-US strategic partnership. The 2005 Joint Statement and the nuclear pact, therefore, envisaged a strategic partnership with India, to help India become a major power and admit it to the NSG and the non-proliferation regime.[37] These are unprecedented offers by the US to India in their 60 years plus relations which had largely been strained. The public opinion in India largely accepted the US offers to help

36. Singh, n.22.
37. India-US 2005 Joint Statement, "Joint-Statement between President George W. Bush and Prime Minister Manmohan Singh", Office of the Press Secretary, U.S. Department of State, July 18, 2005, Washington DC., http://georgebush-whitehoue.archives.gov/news/releases/2005/07/print/200507 18-6.html. Accessed on June 28, 2009.

India get into the NSG and the non-proliferation regime.[38] The US offers of strategic partnership and help to make India a "major power" through the nuclear pact were rejected by the left parties and the BJP.

The public opinion in India largely accepted the US offers to help India get into the NSG and the non-proliferation regime.

STRATEGIC PARTNERSHIP

Discourses in the US refer to a rising China as the fundamental push factor for the nuclear pact and the strategic partnership.[39] Subsequently, the US Congress concluded that the nuclear agreement comprised more than non-proliferation or economic gains, and extended bipartisan support. India concurred with the July 2008 Lok Sabha trust vote and the 123 Agreement was sealed on October 10, 2008.

While the US' strategic partnership intent is clear about its desire to allocate a balancing role to India in view of the rise of China, India has been ambivalent about this China-containment partnership.[40] A major factor driving this ambivalence is the tradition of strategic autonomy in India's foreign policy. Notwithstanding this ambivalence, the strategic partnership has progressed steadily. Perhaps, India's acquiescence to this role is because the strategic partnership accords India a central role in South Asia and the Asia-Pacific region. According to Senator John McCain, India and the US share three strategic interests. First, to develop South Asia as a region with secure, prosperous and democratic states. Second, to project a "preponderance of power in the Asia-Pacific region" for promoting "free markets and free societies". Finally, to

38. G. Balachandran (2013) argues that India "does not stand to gain anything specific" from the getting into the NSG as a new member. On the contrary, India's nuclear journey both strategic and civil had been stunted because of the technology denial regime. Getting access to dual-use technology, strategic fuel supply and advanced nuclear reactors are the advantages NSG membership entails. See: India and NSG, G. Balachandran (2013), "Approaches to Indian Membership," IDSA Issue Briefs.
39. Carter, n.10.
40. Ashley J. Tellis:, "Kick-Starting the US-Indian Strategic Partnership" Carnegie Endowment for International Peace, Washington DC, September 22, 2014, http://carnegieendowment.org/2014/09/22/kick-starting-u.s.-indian-strategic-partnership. Accessed on January 20, 2014

fortify a "liberal international order" which promotes and ensures peaceful growth and development of human rights.[41]

From the 2004 Next Steps in Strategic Partnership (NSSP) onwards, the India-US strategic partnership gradually gained clarity in direction, momentum and traction. Taking these steps forward, they signed the 2005 Defence Framework Agreement and the 123 Agreement which changed the parameters of their engagement.[42] The 2005 Joint Statement announced the nuclear pact, besides scores of other areas, from promoting trade and commerce and democracy to cooperation in science and technology. But post-2008 nuclear pact saw the rise of divergent geo-political interests and domestic political preferences, leading to major differences between the two countries. Notable among them were India's MMRCA acquisition processes, the Ukraine crisis and India's silence, the Devyani Khobragade affair and the CLNDA 2010.

The Modi-Obama summit diplomacy rebooted the strategic partnership. From the 2014 "*Chalein Saath-Saath*" Vision Statement to the 2015 "Declaration of Friendship", the statements outlined the broad contours of engagement that the two countries are already undertaking. "Asia Rebalance", the key theme of the US, has not changed. In this balancing strategy, the US stated that it accorded India the central role in the region.[43] The January 2015 summit diplomacy announced the resolution of the nuclear deadlock. It also renewed the 2005 Defence Framework Agreement. India and the US continue their cooperation in their bilateral efforts to promote democracy, combat terrorism, promote higher education, collaborate in science and technology and conduct joint military exercises, among others.

The India-US strategic partnership depends on how India can manoeuvre the complex balancing acts between its geo-political interests and domestic political preferences. In addition to the partnership with the US, the challenge

41. Press Trust of India, "India, US Must be Committed to a True Strategic Partnership: John McCain", NDTV World, June 27, 2014, Washington DC, http://www.ndtv.com/world-news/india-us-must-be-committed-to-a-true-strategic-partnership-john-mccain-581646. Accessed on January 7, 2015.
42. Chintamani Mahapatra, "India-US Strategic Dialogue: An Assessment", *Strategic Analysis*, vol. 37 no.6, 2013, pp. 675-80.
43. Embassy of the United States of America, "The Fifth Round of the US-India Strategic Dialogue", New Delhi, July 2014, http://newdelhi.usembassy.gov/strategic_dialogue.html. Accessed on January 7, 2015.

of Russia and China ganging up comes as a serious strategic balancing dilemma. Membership offers by Russia and China in the Asia Pacific Economic Cooperation (APEC) and the Shanghai Cooperation Organisation (SCO) are tempting offers which India could not resist. Foreign Minister Sushma Swaraj's China visit in February 2015 and the declaration that India would seek an "inclusive security system in the Indo-Pacific Theater" and not be driven by the "Western-led China-containment policy" is a reflection of India's ambivalence.[44] Russia and China offered India membership in the APEC and SCO as a counter-balance to the India-US strategic partnership.

Major Power

Although George Tanham doubted India's strategic culture, independent India nursed a great power aspiration and had worked towards achieving it.[45] It rallied around numbers for security and growth. The 1946 Asian Relations Conference, a precursor to the Non-Aligned Movement (NAM) was the beginning of this initiative. India's leadership and membership of the NAM was a conscious decision to escape the costly bipolar balancing politics. By the late 1970s, India had been described as an "emergent power". After the post-reforms period, the world saw India as an "emerging power".[46]

Post-Pokhran II, the US saw India as an alternate balancing pole in the region and offered to help it become a "major power".[47] Realising that its great power aspirations are not complete without access to high-technology; India accepted the offer to help it become a major power with two caveats: it would retain its strategic autonomy; and, it wants an increase in trade and technology transfers. There are two challenges to India's rise as a major power through the US help. First, India has a doctrine-equivalent preference for strategic autonomy in the conduct of its foreign policy. India's foreign policy priority is for strategic autonomy since independence has kept it away from any formal

44. Press Trust of India, "Caution Needs to be Exercised on India's NSG Inclusion: China", *The Times of India*, January 25, 2015, Beijing, http://timesofindia.indiatimes.com/world/china/Caution-needs-to-be-exercised-on-Indias-NSG-inclusion-China/articleshow/46020682.cms. Accessed on January 7, 2015.
45. George K. Tanham: *Indian Strategic Thought: An Interpretive Essay* (California: National Defense Research Institute,1992).
46. P. Stephen Cohen, *India: Emerging Power* (Washington, D.C: Brookings Institution Press, 2001).
47. n.3.

alliance. During the nuclear negotiations, the US expected India's commitment to a strategic balancing role.[48] India, however, declined an open declaration of the China-countervailing role in the Asia-Pacific region. Instead, it voted against Iran at the UN, its long-time ally in the Middle East.

Second, India and the US, notwithstanding their "natural allies" status as democracies, and as states facing the challenges of terrorism, have comparatively limited areas and depth of cooperation. The US is India's largest trading partner and one of the states with the largest Foreign Direct Investment (FDI) in India. On the other hand, for the US, India was its 11th largest trading partner, 18th largest export destination and 10th largest supplier of goods to the US in 2013.[49] China and the US have far bigger trade volumes even though they have strong suspicions about each other motives.

Given this asymmetry in fundamental interests, India's expectations from the US to transfer high-end technology related to defence and security matters without a strong strategic partnership are unlikely to be realised.[50] The path to evolution as a great power requires substantive proficiency in defence and security technology. The gestation period of indigenous technology in India is extremely long to go on its own. Access to this high-end technology is essential for India to emerge as a major power. For instance, the conceptualisation and development process of the Tejas, India's Light Combat Aircraft (LCA) has been going on since 1983. Induction of this aircraft into an active battle ready service format is still far from reality. The first squadron of this LCA comprising 20 aircraft would be inducted only by 2017-18.[51] Delays and cost overruns are the major issues dogging India's defence industries, whether from the Defence Research and Development Organisation (DRDO) or Hindustan Aeronautics Limited (HAL).

The India-US nuclear pact underlined the fact that the key to India's emergence as a major power is getting access to high-end technology, the

48. Carter, n.10.
49. US Trade Representative, "US-India Bilateral Trade and Investment", Office of the United States Trade Representative, Washington, D.C. 2014, https://ustr.gov/countries-regions/south-central-asia/india. Accessed on January 6, 2015.
50. Tellis, n.40.
51. Dinakar Peri, "Operational LCA Still Years Away", *The Hindu*, January 20, 2015, New Delhi, http://www.thehindu.com/news/national/operational-lca-still-years-away/article6804951.ece. Accessed on January 6, 2015.

technology denied by the nuclear non-proliferation regime. Among other reason, due to the India-US symmetric status as democracies with the preponderance of the rule of law, the US does not see India's rise as a threat to its interests. Both, however, see China's rise as a threat to the region and the world. The two states, thus, share convergence of win-sets in strategic interests.

NSG Membership

The US had stated that it would help India get into the nuclear club. The NSG membership enrolment process for India has been initiated. However, as a multilateral regime with the consensus-rule in its decision-making, India's NSG membership will depend upon how India and US rally the NSG members to balance between the normative ideals of the regime and their strategic and commercial interests. As a buyers' market, the 2008 NSG's "clean waiver" for India was driven by high-diplomacy, strategic and commercial interests' logic. The 2005 Joint Statement and the 2008 nuclear pact, assumed India's compliance with the non-proliferation regime. India's IAEA safeguards and its reiteration on the voluntary moratorium on nuclear tests brought about the NSG's "clean waiver'. Under the present circumstances, India's entry into the NSG is likely to take the same route it took for the 2008 NSG waiver: diplomacy, strategic and commercial interests.

To take this process forward, following Obama's 2010 statement to consider India's NSG membership, a note from the US entitled "Food for Thought" was circulated to the NSG members championing India's membership. To consider India's membership, the note suggested two approaches: (1) "revise" the existing NSG membership criteria; or (2) only "consider" the existing criteria for new membership instead of making it a requirement.[52] Hindered by the divergent domestic politics and the stalling of the nuclear pact, the process has not made any significant step beyond the "Food for Thought". Meanwhile, critics have launched opposition to the membership process for India as a non-proliferation loss. Denouncing the

52. Richard J.K. Stratford, "United States Communication – "Food for Thought," Paper on Indian NSG Membership", *Point of Note Contact, NSG Confidential, United States Department of State*, Washington DC, May 20, 2011. https://www.armscontrol.org/system/files/nsg1130.pdf. Accessed on January 6, 2015;

Except the NPT membership obligation, India has, by and large, fulfilled all the stipulated criteria for NSG membership at the moment.

India-US nuclear pact, John Kimball, an American non-proliferation lobbyist stated that strategic and commercial interests are factors which have been hurting the NSG and the non-proliferation regime.[53]

Except the NPT membership obligation, India has, by and large, fulfilled all the stipulated criteria for NSG membership at the moment. The issue will need to go beyond the two options suggested by the "Food for Thought": "revise" and "consider". Considering the consensus rule, India's NSG membership will depend on how India and the US handle the issues raised by China and other NSG states. Existing NSG membership criteria stipulate that the new members should: (a) "be able to supply the items on the NSG control lists; (b) adhere to, and act in accordance with, the guidelines; (c) be supportive of international efforts towards the non-proliferation of weapons of mass destruction and of their delivery vehicles; (d) be a party to, and in full compliance with, the obligations of the NPT and various nuclear weapon free zone treaties; (e) and have in force a comprehensive safeguards agreement with the International Atomic Energy Agency (IAEA)".[54]

As long as India-US strategic and commercial interests were on the same wavelength, the NSG's waiver was "clean". Post-CLNDA, the 2008 NSG's "clean-waiver" saw a clear policy reversal. The new NSG guidelines issued in June 2011 refer to NPT membership as the new criteria for "clean waiver".[55] Nonetheless, the Modi-Obama diplomacy has shown that India and the US can overcome domestic differences and honour international commitments

53. Daryll Kimball, "Indian Membership in the NSG? A Bad Idea Whose Time Has Not Come", *Arms Control Now, The Blog of the Arms Control Association*, June 23, 2011, https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=9&cad=rja&uact=8&ved=0CE0QFjAI&url=http%3A%2F%2Farmscontrolnow.org%2F2011%2F06%2F23%2Findian-membership-iin-the-nsg-a-bad-idea-whose-time-has-not-come%2F&ei=DrfUVKvcNITkuQTliIIg&usg=AFQjCNFDl8X_Yn4N9qZ67S8hjswEpxoR9g&sig2=xLyXOPLbTohcMmqAZmLc0A&bvm=bv.85464276,d.c2E. Accessed on January 6, 2015.
54. Kimball, n.53.
55. Siddhartha Varadarajan, "NSG Ends India's 'Clean' Waiver", *The Hindu*, June 24, 2011, (New Delhi), http://www.thehindu.com/news/national/nsg-ends-indias-clean-waiver/article2132457.ece. Accessed on January 5, 2015.

too. India's NSG phased entry will depend on how the politically unencumbered majority government of the Modi government honours its commitments in the nuclear pact and promotes common strategic interests. Dispensing generic goodwill and fulfilling international commitments are the key ingredients of a statesman to enlarge the win-set.

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MODI-OBAMA EQUATIONS

Do the two leaders have the capabilities to take the nuclear pact to its logical conclusion? After Modi's US visit in September 2014, the buzzword in the diplomatic circles was that Modi and Obama share a personal "chemistry". President Obama's Deputy National Security Adviser Benjamin J. Rhodes, hoped that the "chemistry and the personal relations between the two leaders can lead to positive outcomes".[56] Persistence and consistency are essential ingredients of diplomats. The Modi-Obama diplomacy clocked about five meetings in a span of five months since they first met in September 2014 at Washington, D.C. till the January 2015 summit. Three other meetings took place in Myanmar, Japan and Australia in 2014. The latest meeting in 2015 in New Delhi led to the breakthrough in the nuclear pact imbroglio. Eventually, their gritty determination paid off.

The quantum and quality of the diplomatic meetings are said to indicate the focus and commitment of the leaders to reach their targets. The India-United States Contact Group, set up to discuss the nuclear pact in June 2014, met at least three times to enable the two leaders to announce the activation of the nuclear pact. The 2014 Vision Statement and the Delhi Declaration of Friendship are essentially repackaging of the substantive issues in which they have earlier agreed to work together. Now the two have found convergence of interests in disarmament and non-proliferation issues.

56. Ellen Barry: "Unlikely 'Chemistry' Benefits Both Obama and Modi", *The Hindu*, January 23, 2015, New Delhi, http://www.thehindu.com/news/national/unlikely-chemistry-benefits-both-obama-and-modi/article6815376.ece?ref=relatedNews. Accessed on February 9, 2015.

Further, unlike George Bush, whose term was at its fag end when the 123 Agreement was signed, Obama and Modi have more time and political mandate to oversee the implementation of the nuclear pact and the strategic partnership. Obama's presidency will go on till 2016 while Modi will be prime minister in a BJP-majority Lok Sabha until 2019, giving them two years to work together on the tasks set out in the nuclear pact. Unlike Manmohan Singh, whose allies in the left parties challenged the nuclear pact, Modi does not confront any internal party or legislative issues.[57]

The Modi-Obama diplomacy underlined the need for their strategic partnership and the US promise to help India become a 'major power'. NSG membership for India, however, will be an uphill task, considering the consensus rule of the NSG working system and India's status as an NPT-outlier state. During his second India visit, President Obama stated that India had fulfilled the criteria of the Missile Technology Control Regime (MTCR) and NSG, and so the US supported the inclusion of India into the four non-proliferation regimes. Reacting to this, China issued an ambivalent statement. Hua Chunying, China's Foreign Ministry spokesperson stated that China supports the "discussion" and "inclusion" of India as a NSG member "if it meets all the requirements".[58]

CONCLUSION

Estranged India and the US have become "natural allies" and are engaged in a "partnership of the 21st century". Convergence of win-sets following the restructuring of the international balance of power and India's shift

57. Sujatha Singh, foreign secretary, was replaced by S. Jaishankar after she had differences of opinion on foreign policy with the Prime Minister's Office. According to news reports, Singh preferred the traditional approach on Israel, while Prime Minister Modi wanted improved relations with Israel and Denmark. See Indrani Bagchi, "Why PM Narendra Modi was Unhappy with Former Foreign Secretary Sujatha Singh", *The Times of India*, January 30, 2015, (New Delhi). Accessed on January 9, 2015 [Online: Web] URL: http://timesofindia.indiatimes.com/india/Why-PM-Narendra-Modi-was-unhappy-with-former-foreign-secretary-Sujatha-Singh/articleshow/46059940.cms

58. Press Trust of India, "Caution Needs to be Exercised on India's NSG Inclusion: China", *The Times of India*, January 25, 2015, Beijing, http://timesofindia.indiatimes.com/world/china/Caution-needs-to-be-exercised-on-Indias-NSG-inclusion-China/articleshow/46020682.cms. Accessed on January 7, 2015.

from a primarily autarkical economy to a global economy has brought them closer. Thereafter, the 2008 nuclear pact made this partnership possible by resolving two issues bedevilling India-US relations. First, the US does not target India as a "non-proliferation concern" any longer. Second, India's "anomalous nuclear status" has been accorded a new definition of a state with advanced nuclear technology with impeccable non-proliferation credentials. Along with this paradigm shift, the nuclear agreement assured India the benefits and advantages, as accorded to the NPT-nuclear weapons states, for undertaking the responsibilities as such states. Toward this, the "chemistry" and personal relations between Modi and Obama helped to resolve the liability and safeguard issues stalling the nuclear pact.

The India-US 2008 nuclear pact is technically a civilian nuclear agreement but it opens a wider scope of benefits by resolving the thorny issues besieging their relations. Although it is unlikely to provide energy security even after many years, it opens the opportunity for access to nuclear materials and related technology in the defence and security areas as well. Getting access to these technologies, which can help India realise its great power aspiration, was the principle driving force behind the nuclear pact. In the US calculation, once India acquires great power capability, its sheer size would have the desired effect of providing a countervailing force to a rising China. As the nuclear negotiations progressed, the US gave up its insistence on India's commitment to this balancing role in the Asia-Pacific region.

'Chemistry' and personal relations in the Modi-Obama diplomacy were crucial in breaking the deadlock posed by the liability and intrusive safeguard issues. It took about five months and five meetings between Modi and Obama, aided by at least three contact group meetings between June 2014 and January 2015, to resolve the deadlock. India's great power aspirations and NSG membership will require more intensive bilateral and multilateral engagements. As the 123 Agreement opened a flurry of similar offers as well as the "clean waiver", India's route to NSG membership could be its projection as a vast and compelling nuclear energy market which no NSG member can ignore. As Putnam noted, domestic politics and diplomacy are always entangled. The India-US nuclear pact was possible

due to the overlapping win-sets. Driven by their overlapping interests, in an unprecedented move, their divergent domestic issues have been set aside for common strategic interests.

The India-US nuclear pact is an agreement caused by broad overlapping win-sets on the geo-political and domestic fronts. The deal got entangled temporarily in India's domestic liability laws and the US insistence on intrusive tracking of its fuel besides the IAEA safeguards. India's win-set size shrank due to the safety and liability issues informed by the Bhopal gas tragedy. Fukushima and the 2011 NSG guidelines further shrank India's win-sets. Yet, the Modi-Obama diplomacy realigned the shifting and incongruent win-sets to activate the stalled nuclear deal. Going by the 'chemistry' and personal rapport between the two leaders, India and the US can look forward to more robust relations, from nuclear cooperation to a deeper strategic partnership.

INDIA'S POLICY OPTIONS TO CHANGE PAKISTAN'S BEHAVIOUR

ANKIT KUMAR

The India-Pakistan relationship is one of the few in the world which is dictated by passions and emotions on both sides of the border. The result of a hockey match between India and Pakistan in any part of the world has repercussions in the subcontinent. One day, the leaders of the countries would be holding talks to resolve disputes and make permanent peace and the very next day, there would be an attack. This showcases the dynamics of the relationship between India and Pakistan, which despite sharing a common history and culture, are poles apart. What India and Pakistan share with each other is mutual dislike, disdain and mistrust. Kashmir continues to remain a flashpoint, with warnings that a fourth war on Kashmir is imminent[1]. For India, avoiding another war and eliciting a favourable outcome will remain a challenge. Are these indicators that India needs to adopt a new kind of approach with Pakistan?

The Secretary General of the United Nations Ban Ki-moon has reiterated on several occasions that peace in Jammu and Kashmir (J&K) can be achieved only through dialogue. There is nothing new in this suggestion. In fact, it has been one of the oldest approaches and has been repeatedly tried so as to establish a peaceful relationship which would be conducive to resolution of the disputes. The Shimla Agreement (1972), Lahore Declaration (1999), Agra

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1. "Pakistan's PM Sharif 'says J&K Could Trigger a New War with India'", *Daily Mail*, available at http://www.dailymail.co.uk/indiahome/indianews/article-2518303/Pakistans-PM-Sharif-says-J-K-trigger-new-war-India.html. Accessed on December 10, 2014.

Despite all the challenges and predictions of its collapse, Pakistan's economy has grown at the rate of 5 percent since 2005. With the changes in the trend in Pakistan and Asia, an economically stronger Pakistan might prove to be a bigger national security threat for India than it has been so far.

Summit (2001) – the list suffices to suggest that India has made several attempts to have a meaningful dialogue with Pakistan which would bring about some stability in the relationship, which could then result in a possible permanent settlement of the disputes. But the result speaks for itself. Contrary to expectations, Pakistan's policies against India have only become more sinister. The all-powerful Pakistan Army and Inter-Services Intelligence (ISI) have been at the forefront to derail the peace processes. Pakistan continues to use state-sponsored terrorism to carry out attacks in India. As recently as in the South Asian Association for Regional Cooperation (SAARC) Summit held in Kathmandu in November 2014, Pakistan made all efforts for, and succeeded in, blocking India's efforts for regional integration. With such a background, if a dialogue is possibly held, how meaningful would it be? Importantly, is it possible to reach a win-win solution?

Pakistan has managed to beat the odds. Despite all the challenges and predictions of its collapse, Pakistan's economy has grown at the rate of 5 percent since 2005. With the changes in the trend in Pakistan and Asia, an economically stronger Pakistan might prove to be a bigger national security threat for India than it has been so far. This article makes a case for a gradual shift in India's Pakistan policy if India is to feel secure in South Asia. A powerful China and a stronger Pakistan could spell double trouble for India even if India improves its defensive capabilities. In such a scenario, it is imperative that India should try to explore if it can force Pakistan to change its behaviour. Changing Pakistan's behaviour, though not easy, is important, because as Lord Meghnad Desai puts it, "Pakistan is no longer a threat, it is a pin-prick" and the best way to deal with such irritants is to force them to change their behaviour.

This article is not about what India and Pakistan should do to resolve their disputes and make peace with each other. There are many peaceniks who still believe, and advocate, that the way forward to having a good relationship with Pakistan is through dialogue. But if history has taught anything, it is that India and Pakistan cannot have a peaceful relationship, at least not in the near future. Because 67 years of dialogue have failed to improve the relationship and the final outcome of the peace process is inconsequential. India and Pakistan perceive each other as mortal enemies. On the one hand, Pakistan promises India a peaceful relationship if the dialogue is continued but, on the other hand, it uses the peace process as an opportunity to carry out covert operations against India. The same happened when Nawaz Sharif was reelected as prime minister but soon all the euphoria and optimism for a peaceful India-Pakistan relationship dissipated when the Pakistan Army took charge of the situation. This article explores the policy options that could be employed by India to force a behaviour change on Pakistan. More than a friendly relationship with Pakistan, India should be concerned about its security. This paper suggests four options that may be utilised in combination to force Pakistan to mend its ways.

On the one hand, Pakistan promises India a peaceful relationship if the dialogue is continued but, on the other hand, it uses the peace process as an opportunity to carry out covert operations against India.

PAKISTAN: A FAILED OR A FAILING STATE?

According to the theory, propounded by authors James Robinson and Daron Acemoglu, in the book *Why Nations Fail: The Origins of Power, Prosperity and Poverty*, it is political institutions that determine the fate of nations and not economic policies, geography, culture, or value systems[2]. Nations succeed when political and economic institutions are "inclusive" and "pluralistic", creating incentives for everyone to invest in the future; and nations fail when

2. Michele Boldrin, David K. Levine and Salvatore Modica, "A Review of Acemoglu and Robinson's Why Nations Fail", at http://www.dklevine.com/general/aandrreview.pdf. Accessed on December 12, 2014.

institutions are "extractive," protecting the political and economic power of only a small elite that takes income from everyone else[3]. The theory is sufficient to suggest the status of Pakistan as a success or failure. Pakistan's ranking on the Failed State Index issued by the Fund for Peace dipped from 13 in 2013 to 10 in 2014[4]. However, this is not surprising given that Pakistan has been in the list of top 10 failed states ever since the ratings started in 2005. This begs the obvious question that even after so much financial aid, why has the situation not improved? There are various reasons for this, ranging from geographic location, absence of an education system, lack of economic reforms, etc. But the most important of all is perhaps that Pakistan wants to maintain an image of a 'failing state'.

According to Christine Fair, an expert on Pakistan, "Pakistan is not a failed state. It is not a failing state, and it's not a state that will fail. Pakistan is actually very stable. Pakistan's military takes basically all the resources that it wants and needs, and invests those resources into the security competition with India. And that's how it is able to draw in the international community and extract sustained international aid."[5] This aid is essential to keep the entire state on life support, and Pakistan as well as the international community will ensure that the aid does not dry up. So, the theory in India that Pakistan will collapse and it will be a bad thing for India is simply a myth. Because history suggests that the Pakistan Army is going to ensure the survival of the state at any cost.

If two states want to have a good and mutually beneficial relationship, it is essential that both bury or resolve their disagreements, and cooperate. India wants a peaceful relationship with Pakistan and the political class in Pakistan has reluctantly tried to reciprocate. However, whole-hearted support from Pakistan is missing. The political section and a significant

3. William Easterly, "The Roots of Hardship", *The Wall Street Journal*, at http://www.wsj.com/news/articles/SB10001424052702304724404577293714016708378?mg=reno64-wsj&url=http%3A%2F%2Fonline.wsj.com%2Farticle%2FSB10001424052702304724404577293714016708378.html. Accessed on December 12, 2014.
4. "Fragile State Index 2014", The Fund for Peace, at http://library.fundforpeace.org/library/cfsir1423-fragilestatesindex2014-06d.pdf. Accessed on December 14, 2014.
5. "Pakistan Exploits 'Failed State' Image, Says US Scholar", Radio Free Europe/Radio Liberty (RFE/RL), at http://gandhara.rferl.org/content/pakistan-fair-failed-state/26544552.html. Accessed on December 14, 2014.

Pakistani middle class wish to have a peaceful relationship with India. But unfortunately, they do not have much say in deciding Pakistan's foreign and security policies. Pakistan has been, and would continue to be, ruled by the military, either directly or indirectly. So regardless of who gets elected to power, the democratically elected government has no power or authority over the military and its policies.

Pakistan, though formed on the basis of religion, was not a theocratic state. The idea of Pakistan was to be a liberal constitutional state with a Muslim majority. But the initial instability in the top leadership saw power slip to the Punjabi dominated military which became the ruler of the state. The priority of the military rulers was to keep Pakistan united by any means and so a national narrative of nationhood was imposed upon all the different regions of Pakistan. Pakistan, as a nation, continues to struggle for an all inclusive narrative and national identity. There is no single narrative to combine the four separate regions into one nation. It has lacked a leadership which can fashion an inclusive narrative. This is why democracy is so fragile in Pakistan. Being a Muslim alone is not enough to survive in the Islamic Republic of Pakistan. The one good thing has been that no leader has so far tried to make Pakistan a purely Islamist state. But this might change with the rise of radical Islamism in Pakistan. Meghnad Desai says that the fragility of nationhood of Pakistan is the reason why all the sides in Pakistan need India as an enemy and Kashmir as a cause to keep them united[6].

Economically, the country has not done very well. There is high inflation, widespread corruption, unemployment and an economy which is dependent on foreign aid for survival. There is also an acute energy crisis in several areas of Pakistan. However, in the last five years, Pakistan's economy has improved despite the clumsy state of affairs. Pakistan recorded a Gross Domestic Product (GDP) of $237 billion in 2014 which was 5 percent higher than last year[7]. The problem is that instead of using the GDP for

6. Meghnad Desai, "Out of My Mind: The Idea of Pakistan", *The Indian Express*, available at http://indianexpress.com/article/opinion/columns/out-of-my-mind-the-idea-of-pakistan/99/. Accessed on December 15, 2014.
7. "Pakistan's GDP Growth Rate", *Trading Economies*, available at http://www.tradingeconomics.com/pakistan/gdp-growth. Accessed on December 15, 2014.

It can be assumed that Pakistan cannot have a peaceful relationship with India until the military is brought effectively under the civilian authority. The ISI also would have to be reined in for the peace process to be given a chance.

development and the welfare of the population, a large part of it is provided to the military. And this is not surprising given that in Pakistan, the military is considered the most important institution as the survival and existence of the state depends on it. To get all the privileges, the military has to keep emphasising its importance to the people of Pakistan and so it is extremely difficult for the military to agree to a good relationship with India as it would undermine its importance and, hence, its power. So, without exaggeration, it can be assumed that Pakistan cannot have a peaceful relationship with India until the military is brought effectively under the civilian authority. The ISI also would have to be reined in for the peace process to be given a chance.

WHY THE US SUPPORTS PAKISTAN

For all those who are coming to the forefront to rescue Pakistan, stating its new-found zeal to eliminate terrorism, need to pause and rethink. The Pakistani military under Gen Raheel Sharif claims that it is targeting terrorists. However, Pakistan's approach towards eliminating terrorists remains selective. All the operations are being conducted in the northwest of Pakistan, ostensibly to target Al Qaeda. Pakistan is fighting the extremist groups that are opposed to the state of Pakistan like the Tehrik-e-Taliban Pakistan (TTP). This is where the argument from Pakistan of the good and bad Taliban fits in. Pakistan is fighting the TTP, only after the dialogue failed, because it considers the TTP as the bad Taliban. To show the US how serious it is about fighting the extremists, the military claimed to have killed a top Al Qaeda leader, Adnan Shukrijumah, who was on the most-wanted list of the US government. Questions are likely arise about what has changed the Pakistani mindset about terrorism. The answer is simple: the Pakistani military is simply trying to give the US reason for continued support and aid to Pakistan.

However, somewhere, Pakistan is doubtful about the American commitment, as an increasing number of Americans believe that Pakistan, though strategic, has become a liability for them. The US taxpayers are asking questions regarding why their money is being doled out to Pakistan which sponsors terrorism. Indeed, in Pakistan too, people are now questioning the dramatic increase in military assistance to Pakistan post 9/11 which they believe has contributed to the weakening of democratic and civilian institutions in the country, while it has helped to strengthen the military's grip on the socio-political spheres.[8] The US military assistance and support to military dictators has been instrumental in reinforcing the Pakistan Army against the elected civilian governments. Perhaps because the Americans feel that Pakistan would continue to do the job for the US as long as the Pakistan Army is kept on the US payroll and things might be different if a powerful civilian government takes charge in Islamabad. Given the resentment against America in Pakistan, in a way, it is not the Pakistani state but the Pakistan Army that is an ally of the United States. Pakistanis have now realised that their country was made a frontline state by the US to fight the erstwhile USSR after the latter's invasion of Afghanistan in 1979, and again after 9/11 for the war on terror.

The US military assistance and support to military dictators has been instrumental in reinforcing the Pakistan Army against the elected civilian governments.

However, now that the Pakistan Army is hooked to the assistance from the US to such an extent, it is not difficult for the US to manipulate it. The US government's accusation, for the very first time in all these years, that Pakistan uses proxies to fight against India was a setback for the Pakistan Army. Hence, as a face saving exercise and to give some ammunition to the Pakistan lobby in Washington, the army claimed to have killed the top Al Qaeda leader but not before Gen Raheel Sharif spent two weeks in the US meeting several officials. It is essential for Pakistan to maintain its narrative

8. Murtaza Haider, "Can Pakistan Survive Without US Aid?", *Dawn*, available at http://www.dawn.com/news/695692/can-pakistan-survive-without-us-aid. Accessed on December 14, 2014.

of a country targeting terrorists.

A good question is why Pakistan has not conducted any operation against the numerous terrorist camps being run in Pakistan occupied Kashmir (PoK) despite the fact that a majority of Pakistani forces are stationed on the eastern border. If Pakistan is serious about tackling the threat of extremism, why is the government helping the Jamaat-ud-Dawa (JuD) Chief Hafiz Saeed, a US declared terrorist, with a $10 million bounty, in organising anti-India rallies by providing trains to bring in his supporters to Lahore from other parts of Pakistan? It would also be interesting to know why the US is unwilling to do anything about it. Perhaps because Hafiz Saeed's primary target is India and not the US homeland, so why would the US want to strain its ties with Pakistan by eliminating Saeed or by pressurising Pakistan to do so. A popular theory in Pakistan is that the army understands that it cannot eliminate the leader of a powerful terrorist group as it would create more domestic problems for Pakistan. Saeed's anti-India activities serve as a distraction for the public, hence, Pakistan is now trying to "mainstream them" for convenience and perhaps make them part of the national politics[9].

The US wants to build stronger ties with India to address the challenge of a rising China but, at the same time, it also wants to retain its strategic relationship with Pakistan. In a way, the US is trying to create a middle path where it can keep both India and Pakistan content. Current Indian Prime Minister Narendra Modi has said many times that countries should not be selective about terrorism. However, both Pakistan and the United States continue to have a very selective approach, and classification of terrorist organisations into those that are a threat to them and so must be dealt with, and those that are not a threat to them, who are to be left untouched.

CAN PAKISTAN AFFORD TO MAKE PEACE WITH INDIA

In a famous 1947 article, popularly known as the X article, in *Foreign Affairs*, George F. Kennan had argued that the Soviet Union's hostility toward the United States was chronic and incurable, since it was rooted not in a classic

9. Cyril Almeida, "What Strategy?" *Dawn*. Accessed at http://www.dawn.com/news/1149238, on December 7, 2014.

conflict of interest between two great powers, but in deep-seated nationalism and insecurity on the part of Russia, which the US could do nothing about[10]. Dr. Shashi Tharoor believes that something similar could be said about India and Pakistan. He argues, "Straightforward disagreements between two states can be resolved through dialogue and compromise. But how can that work when Pakistan's abiding hostility towards India is rooted in fundamental insecurity about its national identity as the 'not-India' for the subcontinent's Muslims, and even worse, driven by the self-interest of a voracious military which commands a greater share of the national GDP than the military of any other country in the world, and needs this hostility to justify its power and privileges?"[11]

K.P. Nayyar, in his article published in *The Telegraph* in 2001 titled "Hard Truth: No Place for Pakistan Softliners," stated that in Indian diplomacy, with Pakistan, there is no place for a softer approach.[12] This is reciprocated by Pakistan. The 1971 Bangladesh liberation war is etched in the memory of the Pakistan Army, which repeatedly warns the Pakistanis of another Indian invasion of Pakistan. The successful attempts of the Pakistani military and the Inter-Services Intelligence (ISI) to derail the peace talks have only added to the frustration on the Indian side. Chances are that the trend will continue in the future as well. The diplomats in the Ministry of External Affairs (MEA) hold the view that Kashmir is not the disease that ails Indo-Pakistan relations, it is only a symptom. They believe that even if the Kashmir issue, which is portrayed as the root of Indo-Pak hostility, is solved, Islamabad will find something else to needle and bleed India.

The Pakistan Army acts as a roadblock in the India-Pakistan peace process. It fears that peace between India and Pakistan will make Pakistan lose itself to 'Pakistanis'. Implying that the Pakistan Army would not be the most powerful authority in Pakistan any more if this were to happen.

10. George F. Keenan, "The Source of Soviet Conduct", *Foreign Affairs*, vol. 25, no. 4, at http://www.foreignaffairs.com/articles/23331/x/the-sources-of-soviet-conduct. Accessed on December 16, 2014.
11. Shashi Tharoor, "Talking with Pakistan", *NDTV*, at http://www.ndtv.com/article/opinion/talking-with-pakistanis-634766. Accessed on December 15, 2014.
12. K.P. Nayyar, "Hard Truth: No Place for Pakistan Softliners", *The Telegraph*, at http://www.telegraphindia.com/1010722/national.htm#head4. Accessed on December 11, 2014.

For the Pakistan Army and ISI, the *jihadists* and the Afghan Taliban serve a purpose. All the efforts of Pakistan's armed forces are focussed on tackling the TTP because it is this group which is fighting the Pakistan government.

The Pakistan Army had positioned itself many decades ago as the protector of the territory and ideology of Pakistan. It believes that it needs to maintain hostility with India for the continuance of its primacy in a country which is increasingly Islamist in character.

The ISI Game Plan: The late Pakistani Prime Minister Benazir Bhutto had observed that the ISI has become a "state within a state," which is answerable neither to the leadership of the army, nor to the president or the prime minister. The failure of the state government to keep a check on the activities of the ISI, and on corruption, narcotics, and big money, all have made the ISI too powerful. Money generated from drugs is used by the ISI to finance the proxy war against India and Afghanistan.

For the Pakistan Army and ISI, the *jihadists* and the Afghan Taliban serve a purpose. All the efforts of Pakistan's armed forces are focussed on tackling the TTP because it is this group which is fighting the Pakistan government. However, given an opportunity, the Pakistan government would settle for a negotiated truce and power sharing with them. It is only the demand of the TTP for imposition of the strict *Shariah* law throughout Pakistan that is a roadblock in the negotiations. The Pakistani government and leaders like Imran Khan of the Pakistan Tehrik-e-Insaf (PTI) believe that they can reason with the religious extremists[13]. One can just imagine the outcome of this. The fight is not for an equal share of the state's resources but for imposition of an ideology that the extremists believe to be ideal for an Islamic state.

PAKISTAN IS NOT A BULWARK AGAINST ISLAMIC EXTREMISM

In India, there are two starkly opposite views on the stability of Pakistan and its implications for India's interest. One group readily buys the US

13.. "Imran Khan: Talks with Taliban are the Only Solution to Insurgency", *Euronews*, available at http://www.euronews.com/2014/02/27/imran-khan-talks-with-taliban-are-the-only-solution-to-insurgency/. Accessed on December 18, 2014.

argument that a stable Pakistan is essential for regional stability and to stop the flow of radical Islam into India[14], whereas the other holds the view that a stable Pakistan is not in India's interest[15]. They believe that Pakistan works as a bulwark against *jihadists* and is essential in stopping the penetration of the radical Islamic ideology and the extremist groups into the Indian subcontinent. This is on the lines of the Cold War when the US viewed Saddam Hussain as a bulwark against Communism. The theory is that if Pakistan collapses, India will be exposed to these Islamic radicals and would become their target. Is India not already being targeted by the very same *jihadists* that Pakistan was supposed to stop but instead uses them?

The Pakistan Army cannot afford to allow the state of Pakistan to collapse as the army needs a state for its own survival. The famous saying goes that many states have armies but Pakistan is one where the army has a state and it rules it, most of the time directly.

Two things need to be clearly understood. Firstly, the Pakistan Army is the main force that has kept Pakistan united despite so much of domestic dissension and they would continue to do so in the future. In the words of US Secretary of State John Kerry, the Pakistan Army is a "unifying force". However, as Matthew Hulbert explains, "The issue with viewing the military as an agent of stability in Pakistan is that what it might notionally offer as a bulwark against nuclear catastrophe or an Islamic coup, it has consistently taken away by its persistent support of terrorist groups throughout much of its short history."[16] The Pakistan Army cannot afford to allow the state of Pakistan to collapse as the army needs a state for its own survival. The famous saying goes that many states have armies but Pakistan is one where

14. "Stable Pakistan Good for India: Obama", *The Hindu*, available at http://www.thehindu.com/news/national/stable-pakistan-good-for-india-obama/article872580.ece. Accessed on December 18, 2014.
15. Bharat Verma, "Stable Pakistan not in India's Interest" *Indian Defence Review*, available at http://www.indiandefencereview.com/news/stable-pakistan-not-in-indias-interest/. Accessed on December 18, 2014.
16. Matthew Hulbert, "Pakistan: Anatomy of a Crisis, Skeletal Opportunities", The Centre for Security Studies, available at http://www.css.ethz.ch/publications/pdfs/CSS-Analyses-47.pdf. Accessed on December 18, 2014.

There is indeed very little doubt that Pakistan is looking up to China to take up the role of its big brother in South Asia. What is more surprising is that Pakistan is an important ally of two states that have adversarial relations with each other.

the army has a state and it rules it, most of the time directly.

The US would also keep supporting the Pakistan Army in order to ensure the survival of Pakistan. More so because it needs a Pakistan that would do what the US wants it to. And the Pakistan Army has used this effectively to blackmail the US government for obtaining various favours. It seems that whenever the Pakistan Army wants aid from the US, it catches or kills a high value target, which it had probably known about for a long time.

Secondly, with the kind of Islamic radicalisation going on in Pakistan, it is quite possible that India would perhaps face the biggest threat of Islamic fundamentalism from Pakistan itself. The efforts of the current Pakistani central government, political parties and army to make the radicals a part of mainstream politics is certainly a pointer of further Islamisation of Pakistan. The dialogue with the TPP on religious laws, the open monetary and government machinery support to Hafiz Saeed and his organisation, the JuD, proves that Pakistan is willing to make religious extremism a part of mainstream national politics[17]. Even the US declaring the JuD a terror outfit seems to have made no difference as the Pakistan government continues to support the organisation and its anti-India activities. In fact, very few are aware that the concept of an "Islamic State" was propagated by Maulana Maududi, who wanted to establish Pakistan as an Islamic state. His political theory revolves around the idea that "religion and politics are an inseparable entity and the fulfilment of religious diktats is impossible unless and until we organise a political system as per criteria set by the religion." Gen Zia started the Islamisation of Pakistan after being influenced by this ideology. The same ideology seems to have been used by the Sunni

17. Suhasini Haidar, "Pakistan Mainstreaming Terrorism, says MEA", *The Hindu*, available at http://www.thehindu.com/news/national/pakistan-mainstreaming-terrorism-by-facilitating-saeed-rally-india/article6665459.ece. Accessed on December 18, 2014.

extremists who have established the Islamic State in Iraq and Syria (ISIS).

SINO-PAK ALLIANCE

It is due to a combination of astute diplomacy, strategic geo-political location and weak democratic institutions that Pakistan has been a traditional, albeit unnatural, ally of the US and now China. There is indeed very little doubt that Pakistan is looking up to China to take up the role of its big brother in South Asia. What is more surprising is that Pakistan is an important ally of two states that have adversarial relations with each other. Though no one can conclude precisely who has wooed whom and who has used whom in this triangular relationship, it is the Pakistani population that has suffered the most in this game. Particularly, since 2011, the nature of the relationship between Washington and Islamabad appears to be changing due to the increasing distrust between them. This happened because of a series of incidents which included the killing of Osama bin Laden in Abbottabad without informing the Pakistani authorities, the US accusing the ISI of orchestrating a militant attack on its embassy in Kabul, the Central Investigation Agency (CIA) contractor episode, and a North Atlantic Treaty Organisation (NATO) military raid into Pakistani territory near Afghanistan that left 24 Pakistani soldiers dead which led Islamabad to block the US and NATO access to vital Ground Lines of Communication (GLOCs) linking Afghanistan to the Arabian Sea for a period of more than seven months. Now Washington has openly stated a fact that it had known for decades, that Pakistan uses terrorism as a non-state tool against India and Afghanistan. The increasing anti-American sentiment within Pakistan over the drone attacks in Pakistan, which are viewed as violation of Pakistani sovereignty, has become a political issue. These developments have

China's repeated emphasis on getting the support of the Indian government on the "one-China Policy" clearly illustrates its fears. However, Beijing's repeated transgressions on the "one-India policy" puts a question mark on its commitment toward India in return.

With the help of China, Pakistan is hoping to establish a potent domestic military industry which can also export weapons to the Islamic world.

put immense strain on the bilateral relationship[18]. There is a growing fear in the Pakistani military about being abandoned by the Americans. But with the improvement in defence relations between Russia and Pakistan, and Pakistan and China, the US might still hesitate to abandon Pakistan. However, the US policy-makers do understand that for them, Pakistan has become a liability.

China's repeated emphasis on getting the support of the Indian government on the "one-China Policy" clearly illustrates its fears. However, Beijing's repeated transgressions on the "one-India policy" puts a question mark on its commitment toward India in return. Issuing stapled visas to the residents of Arunachal Pradesh, calling PoK "Pakistani territory" and undertaking massive infrastructure development there, or the earlier practice of issuing stapled visas to military personnel posted in Jammu and Kashmir (J&K) show that China is not consistent about the one-India policy[19]. For China, Pakistan is an important strategic asset, especially for China's India policy. With the kind of military activities and infrastructure development projects that China is undertaking in PoK, chances are that it would support Pakistan's case for PoK to be recognised as legitimate Pakistani territory.

With the help of China, Pakistan is hoping to establish a potent domestic military industry which can also export weapons to the Islamic world. A case in point is Pakistan's offer to sell the China-Pak jointly developed fighter JF-17 to Central Asian, African and Latin American countries. This marks a great shift in Pakistan's defence policy which had traditionally relied upon the US and other Western countries for supply of fighter jets to Pakistan. China has made huge economic investments in Pakistan and is helping Pakistan in setting up more nuclear power plants to tackle its energy crises.

18. Susan B. Epstein, K. Alan Kronstadt, "Pakistan: US Foreign Assistance", CRS Report for Congress, available at https://www.fas.org/sgp/crs/row/R41856.pdf. Accessed on December 8, 2014.
19. "One China? What about One India Policy: Sushma Swaraj to Wang Yi", *The Indian Express*, accessed at http://indianexpress.com/article/india/india-others/one-china-what-about-one-india-policy-sushma-to-wang/. Accessed on December 09, 2014.

China has aided Pakistan and helped build its conventional as well as nuclear capability vis-à-vis India so that India remains tied down to the South Asian region.

The situation is becoming increasingly precarious because the threat of fighting a two-front war looms large on India now. India has fought a two-front war once. In 1971, India fought with then East and West Pakistan on its eastern and western flanks—a brief but decisive war in which it emerged victorious. The two-front war scenario that the Indian military planners envisage is with the assumption that in case India goes to war with either China or Pakistan, then the other country would automatically come to its ally's aid. In 1971, the US government had tried to persuade China to open a front with India in order to ease the pressure on East Pakistan[20]. However, China refused to do so. This may have been due to the Indo-Soviet Friendship Treaty that had been signed before the war or because China simply did not want to go in for another war with India, given its economic condition which was as bad as India's. But China's goals and ambitions are different now.

In 1971, the Indian military planners had known for some time that a war with Pakistan on both fronts was imminent and they had time to plan and prepare for it. But a surprise offensive like that of 1965 or 1999, if launched, might prove to be more challenging. Would India be able to take on the combined might of China and Pakistan? The answer is debatable but it will be in India's best interest to avoid fighting a two-front war. And for that, India needs to prevent the two adversarial states becoming powerful in its neighbourhood. It is worth noting that at the time of Operation Parakaram (2001-02), when Indian and Pakistani forces had amassed on the border and a war seemed imminent, Beijing had assured Islamabad that "China hopes Pakistan will not initiate any assault. Pakistan should not get involved in wars and instead focus on economic construction. However, if a war does break out between India and Pakistan, Beijing will stand firmly on the side

20. Pankaj Mishra, "Unholy Alliance", *The New Yorker*, available at http://www.newyorker.com/magazine/2013/09/23/unholy-alliances-3. Accessed on December 10, 2014.

of Islamabad."[21] China has aided Pakistan and helped build its conventional as well as nuclear capability vis-à-vis India so that India remains tied down to the South Asian region. It is in this particular scenario that having a weak and isolated Pakistan seems the best possible strategy for India. However, there is another opinion in India which feels that Pakistan needs to be integrated more closely, politically and economically, with India and South Asia, which would enable Pakistan to have peaceful relations with India, even if the disputes are not resolved in the immediate future.

INDIA'S OPTIONS FOR PAKISTAN

The paramount concern for India should be its security and not "peace at any cost." Peace is desirable but not at the cost of a country's own security. The prospects for a peaceful relationship between India and Pakistan do not appear bright in the foreseeable future. The negative perception of Pakistan in India and of India in Pakistan is one of the basic reasons for the hostility. While only about 13 percent Pakistanis view India favourably, about 15 percent Indians view Pakistan favourably.[22] Until and unless Pakistan starts to see that it is not India that is its enemy but the extremism that the ISI has fanned and nurtured, its attitude towards India is not going to change. To have a peaceful relationship, first and foremost, it is important that countries have the right attitude for it. Many Pakistanis would blame 'external actors' for every terrorist attack in the country, despite the evidence pointing to the contrary, because of the army-backed narrative in Pakistan that militant attacks are the result of America's war on terror and countries like India and Afghanistan, are responsible for the growing militancy in Pakistan[23]. A common Pakistani sees the Pakistan Army as its saviour which has made it the strongest and most priviledged institution.

21. Mohan Malik, "The China Factor in the India-Pakistan Conflict", *Asia-Pacific Centre for Security Studies*, available at http://www.comw.org/rma/fulltext/0403malik.pdf. Accessed on December 18, 2014.
22. "How Asians View Each Other", Global Opposition to US Surveillance and Drones, but Limited Harm to America's Image, Pew Research Centre, available at http://www.pewglobal.org/2014/07/14/chapter-4-how-asians-view-each-other/. Accessed on December 19, 2014.
23. "Despite Billions in aid, US Unable to get Pakistan to Confront Militants", Reuters, available at http://www.hindustantimes.com/world-news/despite-billions-in-aid-us-unable-to-get-pakistan-to-confront-militants/article1-1298111.aspx. Accessed on December 19, 2014.

The increasing Islamisation of Pakistan would create more problems in the relationship. Experts predict that with time, the country will become increasingly violent, for its neighbours and within itself. India requires peace to achieve economic progress and prosperity. If Pakistan is not going to allow India to be at peace, then India needs to adopt a new approach that would force it to make peace with India. Hence, it becomes all the more important for India to consider new approaches to deal with Pakistan.

Ignore: A former secretary of the Research and Analysis Wing (RAW) says that "for long we have held the mistaken notion that we can help Pakistan evolve differently and lead it to a path of everlasting peace and harmony. We have no such divine providence. Only Pakistanis can help themselves. We should not get overwhelmed by the argument that war is not an option for India while Pakistan has the option to unleash *jihad* under a nuclear cover. Since we cannot even try to mend Pakistan, it is best to largely ignore the country for the present and continue strengthening our capabilities till that country is ready to deal with India as a normal neighbour."[24] However, the question remains: is turning a blind eye towards Pakistan a good enough strategy? Would it prove to be so effective that Pakistan would mend its ways? Ignoring Pakistan is not an option because even if India ignores Pakistan, the same kind of reaction is not going to be reciprocated by the other side. As Shashi Tharoor rightly points out, "India cannot grow and prosper by focussing on its economy without peace, and that is the one thing Pakistan can give. India cannot choose to be uninterested in Pakistan, because Pakistan is dangerously interested in India."[25]

Isolate: A second option is of isolating Pakistan within the region and keeping it weak by imposing economic sanctions. Unfortunately, India on its own does not have the wherewithal and influence to achieve this. Also, Pakistan has an ally in China which would make it impossible for

24. Vikram Sood, "Ignore Pakistan till it Starts Behaving Like a Normal Neighbour", *Hindustan Times*, available at http://www.hindustantimes.com/comment/analysis/ignore-pakistan-till-it-is-ready-to-deal-as-a-normal-neighbour/article1-1294911.aspx. Accessed on December 12, 2014.
25. Shashi Tharoor, "Why We Cannot Ignore Pakistan", *NDTV*, available at http://www.ndtv.com/article/opinion/why-we-cannot-ignore-pakistan-636876. Accessed on December 19, 2014.

Experts say North Korea has for decades played a carefully calibrated game of provocation to squeeze concessions from the international community and impress its own military.

the UN Security Council (UNSC) to impose any sanctions on Pakistan. Given Washington's mistrust of Pakistan, India could try to persuade the United States to take such a measure but given the geo-strategic location of Pakistan, the expectation that Washington would break off its ties with Islamabad is not likely to realised. Also, Pakistan has claimed quite clearly that it would launch a nuclear attack on India if India tries to strangulate Pakistan economically, so it is a risky strategy unless India's nuclear deterrence is able to deter Pakistan from launching a nuclear attack.

Pakistan's case bears significant resemblance to that of North Korea. In both states, there is an all powerful military elite that rules the country. All opposition is silenced. The society has been brainwashed and radicalised against a particular enemy. While for North Korea, the enemy is America, in the case of Pakistan, it is the nation of India. The welfare of people in both countries is the last thing on the minds of the military rulers.

But perhaps the greatest similarity between the two is their nuclear posturing. Both states have rationally maintained an irrational behaviour when it comes to nuclear weapons. While the North Korean leadership keeps threatening more nuclear tests (they have conducted three so far), Pakistan has signalled a very low nuclear threshold. Basically, the objective of both Pakistan and North Korea is to compensate for their weaker conventional capability through an irrational nuclear posture.

Experts say North Korea has for decades played a carefully calibrated game of provocation to squeeze concessions from the international community and impress its own military.[26] Pakistan too has played a similar game with the help of the US and Chinese diplomatic and economic support. North Korea would have been more problematic had it achieved anything close to the military prowess of Pakistan. So a Pakistan reduced to the level

26. "North Korea Shells South in Fiercest Attack in Decades", Reuters, available at http://in.reuters.com/article/2010/11/23/us-korea-north-artillery-idUSTRE6AM0YS20101123. Accessed on December 16, 2014.

of North Korea might be easier to handle. For that to happen, the military aid to Pakistan from the US must be stopped, although China will continue to provide aid. Recently, China and Russia lent their support to India when the foreign ministers of the three countries issued a joint communiqué against terrorism, ostensibly aimed at Pakistan.[27] The mounting pressure on Pakistan to stop sponsoring terrorist activities would, perhaps, work.

India should take greater interest in participating in the outcome of the nuclear negotiations with Iran. India could use an ally in Iran to challenge the combined strength of the Saudi-Pakistan alliance, with a focus on Pakistan.

Force Behaviour Change: A journalist suggests that India maintains a pretence about Pakistan, hoping that things would improve in the future, because it is easier than devising new policies to force behavioural change[28]. It is time that India can and should use its image of a game-changer and leverage it with other countries to isolate Pakistan internationally. So far, India has kept its distance from the US because of the incongenial relationship in the past. The new Indian government has shown its intent to put an end to India's anti-Americanism, and rightly so. The interests of New Delhi and Washington converge significantly now. India should use its new found 'strategic partnership' with the United States to make it understand the leverages it has on Pakistan to change its behaviour. The US policy-makers must realise that Pakistan is an international threat, not just for India.

Those who believe that the Middle East is going to remain a priority for the US may be right. But in the future, with the US becoming the top producer of petroleum, it is quite possible that the US would become less influential in the Middle East. However, Israel's security is of primary

27. Ananth Krishnan, "India Gets Greater Backing from China and Russia Over UN Security Council Seat", *Daily Mail*, at http://www.dailymail.co.uk/indiahome/indianews/article-2937182/China-Russia-India-seat-security-council.html. Accessed on February 7, 2015.
28. Seema Sirohi, "Why Does the US Always Back Pakistan?", *The Times of India*, at http://blogs.timesofindia.indiatimes.com/letterfromwashington/why-does-america-always-back-up-pakistan/?intenttarget=no&utm_source=TOI_AShow_OBWidget&utm_medium=Int_Ref&utm_campaign=TOI_AShow. Accessed on December 12, 2014.

concern to the US, so, to safeguard Israel, the US will try to find a way out. A deal with Iran on nuclear development is one such step. India should take greater interest in participating in the outcome of the nuclear negotiations with Iran. India could use an ally in Iran to challenge the combined strength of the Saudi-Pakistan alliance, with a focus on Pakistan.

India should utilise its diplomatic skills to force the US Department of State to include Pakistan on the list of state sponsors of terrorism. As of now, only four countries are on the list and they are basically those that are not on good terms with the United States.

Table 1

Country	**Designation Date**
Cuba	March 1, 1982
Iran	January 19, 1984
Sudan	August 12, 1993
Syria	December 29, 1979

There is a strong case of putting Pakistan on the list because if the JuD is a terrorist organisation, as declared by UN and the US, and the Pakistani government supports it financially and with resources, then it makes Pakistan a sponsor of terrorism. The US Department of State's *Country Reports on Terrorism 2013* that was released in April 2014 clearly states, "The Pakistani military undertook operations against groups that conducted attacks within Pakistan such as the TTP, but did not take action against other groups such as Lashkar-e-Tayyiba (LeT), which continued to operate, train, rally, and raise funds in Pakistan during the past year. The Afghan Taliban and the Haqqani network leadership and facilitation networks continued to find safe havens in Pakistan, and Pakistani authorities did not take significant military or law enforcement action against these groups."[29] Thus, highlighting the

29. "Country Reports on Terrorism 2013", US Department of State, available at http://www.state.gov/documents/organization/225050.pdf. Accessed on December 20, 2014.

selective approach on terrorism that Pakistan maintains. The report further stated, "India remained severely affected by, and vulnerable to, terrorism, including from Pakistan-based groups and their affiliates." If Pakistan gets designated as a state sponsor of terrorism, then the four main categories of sanctions resulting from the designation include restrictions on US foreign assistance; a ban on defence exports and sales; certain controls over exports of dual use items; and miscellaneous financial and other restrictions.[30] This is one effective way of ensuring Pakistan's isolation in the region.

Constrict Pakistan Economically but Cautiously: History has shown that Pakistan has tried to internationalise the Kashmir issue at every opportunity, regardless of what India does. Gen Raheel Sharif, in May 2014,[31] and former President Asif Ali Zardari, in October 2014, have described Kashmir as the "jugular vein of Pakistan." [32]

A retired lieutenant general had stated that India should explore the possibility of brinkmanship, as, at times, it is necessary to take risks in international relations. Economic warfare is one such strategy that India could use. This is a high risk strategy though because of the stated nuclear doctrine of Pakistan which says that Pakistan would launch a nuclear strike on India if it feels that India is trying to suffocate it economically. But should that stop India from testing this strategy?

The US has tried this strategy successfully with North Korea, Iran and now Russia. These countries can launch a nuclear strike on the US but the US' nuclear deterrence is credible enough to stop them from even considering that option. It is important to understand how economic warfare is fought and what would be its impact. The United States started economic warfare against Russia and it is turning out to be highly effective. The rouble is falling in the international market and has reportedly lost 40 percent of its value in the past one year. The falling currency means that Russia is forced to

30. "State Sponsors of Terrorism", US Department of State, available at http://www.state.gov/j/ct/list/c14151.htm. Accessed on December 20, 2014.
31. "Pakistan Army Chief Calls Kashmir the Country's 'Jugular Vein'", *Daily Mail*, at http://www.dailymail.co.uk/indiahome/indianews/article-2618158/Pakistan-Army-chief-calls-Kashmir-countrys-jugular-vein.html. Accessed on December 12, 2014.
32. "Asif Ali Zardari Describes Kashmir as 'Jugular Vein of Pakistan'", *The Economic Times*, at http://articles.economictimes.indiatimes.com/2014-10-14/news/55014284_1_ali-zardari-back-entire-kashmir-jugular-vein. Accessed on December 12, 2014.

Pakistan has been showered with billions of dollars in aid to fight terrorism and develop the economy (the US has given around $28 billion since 2001 alone). But the truth is that the military aid has been diverted from anti-terrorism operations to anti-India activities and the economy of Pakistan continues to be in the doldrums.

export more to save its crumbling economy. Russia's main export is oil and gas and with the downward spiralling prices of oil, it is very unlikely that Russia would make a lot of money from it. The European Union (EU) has given a further setback to Russia by forcing it to abandon Gazprom's South Stream pipeline, which was to supply gas to Turkey. The EU is concerned that importing more gas supplies from Russia would make Moscow the dominant gas supplier in the EU[33]. Under pressure from the EU, Bulgaria is not allowing Russia to proceed with the pipeline though its territory. Experts claim that the 30-year oil deal that was signed between Russia and China earlier this year was at a concessional rate[34]. Putin's inability to rescue the Russian economy is clearly frustrating him.

Indo-Pak trade relations are very limited so India alone imposing economic sanctions would not make much of a difference. Therefore, it is important that Pakistan's economy is targeted by blocking the economic aid that comes from the US and other international organisations, whereby India could force Pakistan's central government to cut the share of the military from the budget. Also, with so much of corruption prevalent in Pakistan, it is not clear what amount of the loans and assistance is actually utilised for economic purposes. Instead, Pakistan should be pressured to carry out domestic economic reforms, which would bring down the power of the political elite and the military. Of course, Pakistan's economic activities are very limited so the targets are limited, nonetheless, it is important

33. "Putin Says Russia Will Abandon South Stream Pipeline", *The Wall Street Journal*, available at http://www.wsj.com/articles/putin-says-russia-will-abandon-south-stream-pipeline-1417461666. Accessed on December 11, 2014.
34. Paul J. Saunders, "The Not-So-Mighty Russia-China Gas Deal", *The National Interest*, available at http://nationalinterest.org/feature/the-not-so-mighty-russia-china-gas-deal-10518. Accessed on December 13, 2014.

that the military and economic aid to Pakistan is dried up. Pakistan has been showered with billions of dollars in aid to fight terrorism and develop the economy (the US has given around $28 billion since 2001 alone)[35]. But the truth is that the military aid has been diverted from anti-terrorism operations to anti-India activities and the economy of Pakistan continues to be in the doldrums. This shows that there is no accountability of the aid that is given to Pakistan.

The meagre trade between India and Pakistan has further not been able to convey to Pakistanis the importance of India as a trading partner for Pakistan.

Separate Politics and Economics: Dr. Tharoor suggests something on the model of China-Japan relations. He advocates that for India and Pakistan to have a peaceful and mutually beneficial relationship, both should keep politics and the economy separate. He says that India should adopt a new approach that "separates the issue of political dialogue from that of trade and people-to-people contact."[36] However, the onus for such an initiative would be on India and it can punish Islamabad for each incident of violence by freezing the talks. Would suspending talks make Pakistan stop using violence against India? Not really, but the Pakistani leadership did get restless when India suspended the talks between the foreign secretaries earlier this year in response to the Pakistani diplomats holding talks with the Kashmiri separatists despite a warning from the Ministry of External Affairs. India could engage with the traders and artists, and earn their goodwill. Promoting people-to-people contacts is a major effort that needs to be undertaken because much of the negativity and misperceptions can be addressed through this move only.

However, Pakistan has showed that it would use economics too for political purposes as was evident when it refused to give India the MFN (Most Favoured Nation) status. The meagre trade between India and Pakistan has further not been able to convey to Pakistanis the importance of India

35. "Pakistan 'Received $25.91b' From US Since 9/11", Direct Overt US Aid Appropriations for and Military Reimbursements to Pakistan,FY2002-FY2015, available at http://www.fas.org/sgp/crs/row/pakaid.pdf. Accessed on December 13, 2014.
36. Tharoor, n. 25.

as a trading partner for Pakistan.[37] If the bilateral trade figures improve significantly, perhaps then Pakistan itself would understand the importance of India and that might lead the political leadership to seek an improved relationship with it but only if they are able to control the military. India would also have to entice the Pakistani trading community for this.

CONCLUSION

India has always made efforts for friendly relations with all countries. However, when it comes to securing the national interest and ensuring national security, countries sometimes have to be ruthless, as was suggested by Chanakya. If there is requisite will on both sides, then India and Pakistan too can coexist peacefully. But it needs to be kept in mind that this should not happen at the cost of national interest. Ultimately, it comes to the decision-makers to choose the kind of policy approach they want to adopt with respect to Pakistan. But since the earlier policies have not given India the desired results, it is imperative that a new policy approach is adopted to make Pakistan change its behaviour and attitude towards India. This is where economic isolation of Pakistan can prove to be effective.

There will be a change in the Pakistan-India relationship only when things within Pakistan change. India can either wait for that to happen or take proactive measures and make that change happen through threats and incentives. For India, ensuring its economic development is far more important than doing the usual business with Pakistan. The economic growth of India might be able to entice Pakistan to seek better relations with it. But till that happens, India needs to adopt a new approach in policy which would force Pakistan to change its behaviour. A balanced mix of the policy of isolation while, at the same time, offering better returns if Pakistan mends it ways, should be used to change Pakistan's behaviour. The dialogue should go on as it would convey the message to Pakistan that India is ready for a better relationship but only if Pakistan is ready to reciprocate.

37. "India, Pakistan Need to Take Steps to Boost Trade", *The Economic Times*, available at http://articles.economictimes.indiatimes.com/2014-01-21/news/46411534_1_trade-facilitation-regional-integration-trade-and-investment-issues. Accessed on December 19, 2014.

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