

Possibility of A Nuclear War In Asia

An Indian Perspective



GG Pamidi

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By

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Preface

This book has had a long gestation. I was fascinated about the deterrence aspect of nuclear weapons and I became more involved with this subject when I was doing my dissertation as part of Master's at Madras University in the mid 1990s. Thereafter, the events of 1999 and 2002 got me thinking about the issue in a different light. Consequently, my diverse reading has taken me to varied strands of thought and I have tried to faithfully record these as kind of bibliographic endnotes, rather than a traditional bibliography, since I thought that it may be more useful to refer it at the point of origin itself. However for the benefit of the more traditionally inclined, there a selected bibliography at the end.

This book is not about the technical aspects about nuclear weapons nor is it about the actual employment or deployment of the strategic assets. It also does not cover the various effects of a nuclear weapon nor does it discuss about the command and control aspects. It is also not about the numbers of nuclear weapons that are needed to achieve credible deterrence by each country. There are numerous authoritative books and studies dealing with these aspects of nuclear weapons and it is not my intention to duplicate those. Suffice to reiterate that it is been established scientifically and beyond reasonable doubt that a nuclear war would be catastrophic and bring with it colossal damage to human lives, property and lasting misery¹. This study is more about the fundamental nature of nuclear weapons and as to how the nations of Asia view these weapons. It is also about the nature of disputes in Asia and the security environment in Asia, both presently as well as in the foreseeable future. Since it is a fact that there are unresolved disputes in the region, it is important to attempt an analysis of potential conflict scenarios. Will the countries succeed in settling their disputes diplomatically? Can deterrence succeed? What will happen if that fails? What will be the shape of future conflicts? I have tried to approach this from an Indian perspective. Do the nuclear powers of Asia view nuclear weapons in the manner that we Indians do, namely, for deterrence against nuclear weapons only? Will these nations use them as weapons of war fighting? If so, what will be the likely provocation for deterrence breakdown? These are the questions which this book attempts to answer.

During the Cold War, driven by the most primitive impulse of each state for its security, the emergence of nuclear weapons was thought to put an end to war and ensure world peace through its deterrence effect. However, nuclear weapons in the possession of a few has actually resulted in a security dilemma in which all states aspire to possess nuclear weapons but face acute security issues all the time. This has resulted in making the world more insecure and unstable since the number of nations that aspire to become nuclear weapon states has actually increased. Nuclear weapons are perceived to be 'safe' in certain hands and 'extremely dangerous' in the hands of some other states. This has not only forced the world to rethink about the relevance of nuclear deterrence but also to an increased scrutiny of the relevance of nuclear weapons itself. The most intense scrutiny is in Asia. While many have attributed the relative 'strategic stability' between the US and the erstwhile USSR to nuclear weapons, it is also undeniable that it has failed miserably to deal with certain facets of asymmetrical warfare. 9/11 has changed the way that the world looks at security. Suddenly, "terrorism" has literally entered the living rooms and the bedrooms of all

nations; western countries included. In the face of such an “indefinable” enemy, the efficacy of conventional force and the nuclear option appears redundant. This is not to state that nuclear weapons have lost their relevance. Nuclear weapons are still very relevant and nuclear deterrence has been successful in deterring conflicts not only between the USA and the former Soviet Union during the Cold War period but has also been successful in deterring conflicts in Asia. For instance, it is widely believed that the nuclear factor has been largely responsible in preventing any open Indo-Pak conflict since 1971.

It is oft said and is also widely believed that the 21st century belongs to Asia and that the two giants of Asia, namely, China and India are going to dominate the world in the ensuing decades. The world’s sole super power, the USA continues to engage actively in Asia. With the presence of so many players, the region is bound to witness historic events, whether these are of intense rivalries or unprecedented partnerships or an uneasy co-existence is as yet unknown. It is also important to analyze whether the future is going to be a repeat of the past history of strife and conflict or has the world learnt from its past mistakes and is now genuinely pursuing conflict prevention processes? While conflict transformation and reconciliation between historic rivals maybe a bit unrealistic in the near time frame, at the very least, will conflict prevention efforts succeed in preventing the outbreak of armed conflict? What, if any, are the scenarios that could possibly result in a conflict in Asia?

Emerging from the chrysalis of its Cold War geopolitical confinement in the South Asian region, India has actively sought to engage purposefully with major powers and emerging power centers, as well as with countries in its immediate and extended neighborhoods. The import and significance of the former Indian Foreign Secretary Shyam Saran’s November 2006 speech in China at the Shanghai Institute of International Studies is worth noting. Asserting that India’s destiny is interlinked with that of Asia, Saran assertively underscored the premises underlying this new vision²:

“Geography imparts a unique position to India in the geopolitics of the Asian continent, with our footprint reaching well beyond South Asia and our interests straddling across different sub-categories of Asia – be it North East Asia, West Asia, Central Asia, South Asia, or South East Asia. To those who harbour any skepticism about this fact, it would suffice to remind that India shares one of the longest borders in the world with China, that Central Asia verges on India’s northern frontiers, that the country has maritime borders with three South East Asian countries, that the Andaman and Nicobar Islands are just over a hundred kilometers from Indonesia, and that the Indian exclusive economic zone spans the waters from the Persian Gulf to the Straits of Malacca”.

This book examines the manner in which nuclearised Asia is shaping and particularly the potential conflict zones in Asia and the “possible nuclear flash points”. Since the study is from an Indian perspective, the focus is naturally biased more towards South Asia vis-à-vis the other parts of Asia. In the study, South Asia includes the region from Afghanistan in the West to Myanmar in the East, and from China Southwards. Today, the region cannot be seen in isolation and hence influences of West Asia as well as North East Asia need to be factored in, as well as the role of the US.

Today, more than ever, doubts persist on the usability factor of nuclear weapons. Are nuclear weapons only meant for deterrence? Is the ability to threaten with ‘unacceptable damage’, only to be taken after use of a nuclear weapon by an adversary? Are there other means available or the

ability to 'raise the costs' of an action that an adversary might want to take by threatening punishment that would make the act seem meaningless and even regrettable. Will India react to another 26/11 type of terrorist incident? Will that result in a conventional conflict? If so, what is likely to be the contours of such a conflict? Will nuclear weapons or threat of nuclear weapons be used at the first instance? Or will it follow a gradual and predictable escalatory ladder? How much of credence should India give to the so-called "red lines"; as enunciated by Pakistan's Lieutenant General (Retired) Khalid Ahmed Kidwai? With Pakistan's Army playing the central role in strategic planning, overall supervision and coordination of nuclear weapons, the statements of a former head of the Strategic Planning Directorate (SPD) cannot be dismissed out of hand. However, the crucial question remains, will Pakistan really adhere to the spatial or economic or force red lines? Or will it be earlier? Are the statements to be taken at face value or are they merely nuclear saber rattling? India, on its part, is engaged in constructing a credible and stable deterrence relationship with both its nuclear armed adversaries, namely, Pakistan and China.

The study also attempts to do a little bit of crystal ball gazing and visualizes threats and a few plausible future conflict scenarios. These have been dealt with a near term, namely for the next about five years, upto approximately 2017 and medium term, which tries to foresee the shape of events for the next about fifteen years, namely, upto about the time frame of 2027. The study also delves on the various nuclear risk reduction and confidence building measures that have been taken and goes on to make several additional recommendations to reduce the likelihood of a nuclear war in Asia. The study also examines the various measures that must be taken by India to tackle the menace of "terrorism" and crafting a suitable holistic response including a military response. The emphasis is on "holistic" solutions since a military response alone can achieve only temporary punitive results and would need more to ensure a truly transformational change. The actual employment of nuclear weapons has not been dealt with nor has the type and number of nuclear weapons needed to secure a credible nuclear deterrence. Finally, the study goes on to make some recommendations that an emerging and resurgent India must take to ensure a secure environment for herself in Asia.

The study does not take a simple uni-directional approach. It is a multifaceted approach in that it is not only a descriptive approach, but also has elements of a predictive approach and, finally, it has even attempted a prescriptive approach. I have drawn liberally from the existing literature and tried to compile all the diverse thoughts together in a concise form. In the process, my own individual thoughts have also been incorporated, in varying form.

Though the study has tried to answer all questions, some tough questions typically deny near solutions. The aim of this study is to get both the policy and decision makers as well as the professional military to think about these issues, so that, in time, workable solutions can be evolved.

While this book emerges from the inspiration, encouragement and assistance of many, the responsibility for all shortcomings of understanding and inadequacies of expression are only mine. I am fully conscious of the fact that I have chosen a vast canvas and possibly have raised more questions in the book than the ones to which I have attempted some answers. However, that is because I genuinely believe that the time has come for India to shed its inhibitions and start thinking like a regional, if not a global player. It is time for India to think beyond the aspects of territorial integrity of land borders alone and begin to look at the strategic boundaries as well.

Keywords: Nuclear deterrence, nuclear risk reduction, nuclear confidence building, nuclear energy proliferation, India, Pakistan, China, US, Iran, Israel, Korea, Middle East.

- ¹ In the 1980s, a number of scientific studies demonstrated that a large scale nuclear war between the United States and the Soviet Union would cause “Nuclear Winter”, a profound worldwide climate disruption with significant decreases in precipitation and average surface temperature.
- ² “Present Dimensions of the Indian Foreign Policy” – Address by Foreign Secretary, Mr. Shyam Saran at Shanghai Institute of International Studies, Shanghai on 11 November 2006.

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I sincerely thank all these learned people for their comments and their prodding me to articulate my ideas on these issues. Of course, I take full responsibility for the final shape of this publication but I am much more confident, having taken my share of criticisms in the earlier rounds.

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-G G Pamid

Introduction

The role of nuclear weapons and the notion of nuclear deterrence are increasingly coming under renewed scrutiny the world over and nowhere is the scrutiny as intense as it is in Asia. The query perplexing strategic thinkers and policy makers is whether these weapons are of any significance in settling disputes or reducing hostilities or are they more in the nature of big power status conferring acquisitions. Paradoxically, it is in Asia that significant events in the nuclear field have occurred in the past few years. Starting with the nuclear tests of India and Pakistan in 1998 in South Asia, going on to efforts of Iran to ‘ostensibly’ develop peaceful nuclear enrichment facilities, as well as the continuing opacity of the nuclear status of Israel in West Asia and culminating in the stand-off between South Korea and North Korea in North Asia, the entire continent appears alarmingly close to various a conflict situations. Nuclear deterrence in the Cold War period was premised upon symmetry of offensive capabilities. This has of course been commented upon extensively and has given rise to the “Security Dilemma”. Voluminous literature exists on this and it is not the aim of this study to add to it, however, it is important that the essence of the dilemma is reiterated since it has a vital bearing on the shape, size and cost of the nuclear forces that the states currently have and will ostensibly have in the future. The idea was introduced by John Herz, an American political scientist in the 1950s. In essence, he developed a structural notion in which self help attempts of states to look after their safety needs tends automatically (i.e., regardless of intention) to lead to rising insecurity for others as each interprets its own measures as defensive and the measures of others as potentially offensive¹. The development of any new defence system threatened to upset this symmetry, apart from plunging into new technology. No treaty was effective in stopping new technology, for example, the Anti-Ballistic Missiles Treaty was concluded in 1972, but paradoxically, the development of new offensive capabilities that could neutralize a ballistic missile continued. General Lee Butler, once the USA’s Commander-in-Chief of the US Strategic Command, is later reported to have this to say about nuclear deterrence “*a dialogue of the blind with the deaf*”².

The five nuclear weapon states of USA, Russia, China, France and the UK attempted to stop the spread of nuclear weapons by a discriminatory Nuclear Non Proliferation Treaty (NPT) in 1967. This treaty attempted to stop the proliferation of nuclear weapons to any other country, apart from the then existing five. The success of the NPT can best be termed to be “partially successful”. With two countries, India and Pakistan, conducting nuclear tests and the third, namely, Israel, widely accepted to be in possession of nuclear weapons, the number of nuclear weapon states is de facto eight today. North Korea too appears alarmingly close to becoming the ninth. When one factors in the fact that six of these nine countries are in Asia, the seriousness of the situation becomes apparent. Paul Bruken states:

“The second nuclear age (that began with India’s nuclear test in 1974) is driven by national insecurities. Its metaphors are fundamentally different from those of

While efforts to reduce the danger of a nuclear conflict has achieved partial success by both the Super Powers during the Cold War period and in the period thereafter, no significant progress has been achieved in horizontal proliferation. More recently, the idea of nuclear weapons free world (NFWF) has gained some momentum as evident in the number of initiatives being offered across the world.⁴ US President Barack Obama too expressed his support for nuclear disarmament in a speech at Prague, the capital of the Czech Republic in April 2009. However, international relations do not seem to be moving in any way towards loosening the stranglehold of nuclear weapons on national security strategies of the five established Nuclear Weapon States (NWS) or the other de facto nuclear weapon states. Nor has there been a reduction in nuclear threats and dangers. Rather new ones such as nuclear proliferation from, by, and to non-state actors, and the risk of nuclear terrorism have been added to the traditional threats of vertical (increase in number of nuclear weapons) and horizontal (increase in number of states with nuclear weapons) proliferation. Nowhere is this as true as in Asia.

Also, increasingly, doubts are being raised about the efficacy of nuclear weapons to provide defence against all threats that a state faces in today's international environment. Traditionally, national security is defined in terms of the ability of a state to protect its interests from external threats. Those interests are broadly defined as territorial integrity, sovereignty and independence of the nation. However in the web of international relations, the threat to security is not from one nation to another but also from various non- state sources of insecurity. There is a growing debate on the need to expand the traditional notions of security to address the nontraditional threats and so develop a more comprehensive approach to security⁶.

This is mainly because the traditional security paradigm does not address the rapidly growing nontraditional threats to security like, “the struggle for resources embedded in the pursuit of energy security, environmental degradation, forced migration, international terrorism, insurgency, ascendancy of non-state actors in drugs, arms, money laundering and financial crime organization⁷.” It needs to be underlined that nuclear weapons are viewed as useful only in deterring the “traditional” threats.

Reality of Nuclearised Asia

No meaningful analysis of the probability of future events in Asia can be made without a cold factual and analytical study of the prevailing situation and drawing up of rational and reasonable assumptions for the future. Asia is on the threshold of a new era. According to Dr Shubash Kapila:

“Asia is fast emerging as the centre of gravity of the global political, economic and military power in parallel with what many view as the progressive diminution of Western hold and dominance over global affairs”.

While the 21st Century may not emerge as “The Asian Century”, as many would like to believe it, but what is emerging as irrefutable is that it will be Asia which would be in driver's seat to usher in the global transformation as never before. China, India and Japan are being seriously viewed as serious contenders for global power status in the emerging ‘New World Order’.⁸ Two rising giants

of Asia, China and India are on an enviable growth trajectory. With the collapse of the Soviet Union, the world is witnessing a shift in the “Power Dynamics of the World”. As the world moves into the second decade of the 21st century, many analysts, particularly western analysts, warn of a new power rivalry which they opine is already taking shape between India and China, Asia’s two behemoths in terms of territory, population and richness of civilization.⁹

While the predictions of an uni-polar world have not actually materialized due to a global recession and a consequent relatively ‘weakened’ USA, today, it appears to be more a ‘diffusion’ of power to a number of nations. The current Asian security environment is turbulent and conflict-prone induced by a number of defining developments, namely:

- ▶ US military interventions in Afghanistan and Iraq following 9/11.
- ▶ Rise in Pan-Islamic fundamentalism and Jihadi terrorism.
- ▶ China’s massive military buildup and brinkmanship policies including with the United States.
- ▶ China’s buildup of Pakistan’s and North Korea’s nuclear arsenals.
- ▶ Conflictual flashpoints all across Asia due to regional rivalries, border disputes or religious and sectarian strife as currently underway in Pakistan”¹⁰.

Regions for Study

Asia is too huge and complex to be studied as one and needs to be studied region wise. Any study on security and possibility of a war in Asia, with a focus on South Asia, has to consider the hierarchy of both the higher as well as the lower level security complexes. As represented during the Cold War era this typically has four layers: domestic, regional, super-regional, and global. For example for India this can be taken as India, South Asia, South Asia plus China and the global level¹¹. Viewed in this manner, the Indian security matrix involves South Asia and the South Asian regional security complex in turn can be said to be surrounded by three other regional security complexes or super-complexes: the South-East Asian complex to the east, the Sino-Russian-Central Asian super-complex to the north, and the Middle East and Gulf super-complex to the west, with Afghanistan and Myanmar occupying ambiguous or multiple positions¹². While all these regions do merit study and have accordingly been addressed in this book, since the study is primarily from an Indian perspective, the region in which we live in and which affects us directly, particularly, South Asia and North East Asia has been dissected in a more deliberate manner vis-à-vis the others.

East Asia. The last few years have also seen the maturation of India’s ‘Look East’ policy launched in the mid-1990s and New Delhi has begun to expand the geographic scope as well as the substance of its ‘Look East’ policy to cover the Western Pacific as an important area of strategic engagement. The expectations of India’s rise have also begun to inject a new dynamism into India’s relations with the great powers of Asia – the United States, China and Japan. As a result, India may no longer be marginal to either the regional politics of East Asia or the great power system that shapes the Asia Pacific theatre. While most analysts appear to be skeptical about the possible future role of India in East Asia, some of the recent work on India’s international relations is beginning to explore the implications of India’s growing economic, political and military engagement with East Asia¹³. East Asia comprises of North East Asia as well as South East Asia.

South East Asia. This consists of the countries that are geographically south of China, east of India and north of Australia. Southeast Asia consists of two geographic regions, namely, Mainland Southeast Asia, also known as Indochina, which comprises of Cambodia, Thailand, Vietnam and Peninsular Malaysia, and Maritime Southeast Asia, which is analogous to the Malay Archipelago and which comprises of Brunei, East Malaysia, East Timor, Indonesia, the Philippines, and Singapore. The end of the Cold War has provided an opportunity for India to renew her relations with South East Asia. The Cold War tended to distort the vision and with the end of the Cold War, without the distorting prism, India had begun to view South East Asia in a more constructive way.

During the last two decades a lot of progress has been achieved and a sea change has occurred in the political atmosphere of Southeast Asia, especially after the Cambodian issue has been settled and with Vietnam becoming a full member of ASEAN on 28 July 1995. Moreover, India's military might in the emergent Asian balance of power cannot be ignored any longer. The Southeast Asian nations have begun to look upon India as a power that can play a kind of 'balancing role' vis-à-vis China in particular¹⁴. On the other hand, it is in India's interest to ensure that Southeast Asia is not dominated by any regional great power. One can expect a lot of USA- China jostling in this area.¹⁵ The fact that South East Asia is a Nuclear Weapon Free Zone and that ten nations are signatories of the treaty makes this region relatively peaceful. *This region does not appear to be a potential nuclearised conflict zone.*

North East Asia. For the purposes of this study, since it is from a nuclear perspective the focus is mainly on North East Asia which has been taken to include China, Taiwan, as well North and South Korea. In the context of a "nuclearised" environment, it is inconceivable that the world's sole superpower, the USA and the rising power, China can both peacefully share the restricted North East Asian "Strategic Space." With China's proxy, the nuclear armed North Korea increasingly becoming more belligerent, the region is definitely a potential conflict zone. The effect of a nuclearised North Korea and the growing belligerence of China and the consequential effect and/or the efficacy or otherwise of the extended nuclear deterrence has been discussed.

South Asia. Although Afghanistan is also sometimes included in a broader definition of "Western Asia", it can equally be considered to be part of Central Asia as well as South Asia¹⁶. Post 9/11 the events have compelled that the whole AF-PAK region be taken as one. So it will not be out of place to state that South Asia has been dominated by the specter of the AF-PAK military imbroglio. Added to this is the reality of growing radicalization in nuclear-armed Pakistan. It is no secret that Pakistan is imploding internally and that fundamentalists seem to be gaining new ground on a daily basis. The assassination of the moderate Governor of Pakistan's Punjab Salman Taseer and more worryingly, the almost reverential treatment to his killer is to put it simply 'acutely alarming' and reflects the slide of the country towards extremism.

Incidents such as the raid by the US Navy Seals to take out Osama Bin Laden in Abbottabad Pakistan's "apparent" ignorance of the presence of Osama on its soil and in the close proximity of its military garrison there, the growing tension in the relationship between the US and Pakistan¹⁷ as well as the recent strains in the otherwise stable friendship between Pakistan and China due to growing unrest in the Xinjiang region and the growing evidence of the Pakistani hand behind such disturbances are all destabilizing factors.

Yet another worrying factor is the report of the alleged efforts of Myanmar to gain access to a

nuclear weapon. Burmese dissidents have accused the junta that rules Myanmar of seeking to acquire nuclear weapons. During 2010, US Secretary of State Hillary Clinton had said that a North Korean shipment of military parts had been received by Myanmar. She had previously expressed concerns about potential nuclear collaboration between the two nations.¹⁸ While China does not form part of South Asia, it is a fact it exercises enormous influence on the shape of events in the region. Hence, China has also been factored in, in this region. As far as the tenuous Sino-Indian equation is concerned, it can be summarized as quoting Dr. Rollie Lal, a political scientist who is a South Asia and East Asia specialist, with extensive experience analyzing the foreign relations and internal dynamics of the region:

*“...that the Chinese leadership now sees India as both a competitor and a junior partner to be used on the increasingly complex Asian chessboard to further Beijing’s national interests, even as New Delhi attempts to do the same vis-à-vis China India is driven to extend its horizons by its own reliance on foreign energy supplies and a nationalist sentiment that calls for the country to assume its proper place on the world stage (e.g., by acquiring a permanent seat on the United Nations Security Council)”.*¹⁹ It remains to be seen whether the Sino-Indian relationship will be primarily a partnership or a rivalry.

The reality that this region is not only a home but also a fertile breeding ground to terrorists has also been factored in. While the possibility of some terrorist group coming into the possession of a nuclear device appears to be remote, the likelihood of some group coming into the possession of fissile material and fabricating a dirty bomb exists. The proliferation concerns of the region have been covered, albeit, only cursorily, since that is a separate study by itself.

Central Asia. The Central Asian region has assumed heightened strategic significance for India since the implosion of the Soviet Union in 1991 which has resulted in the unexpected creation of five independent states – Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, and Turkmenistan – in an area to the northwest of India, between *China* to the east and *Iran* to the west.²⁰ Needless to add, this region though not nuclear is witnessing a “New Great Game” where fierce competition for the area’s vast energy resources is intensifying.²¹ Both the USA and China are deeply entrenched in the region and the Russian imprint, by virtue of its history is strong. The region holds the promise of immense energy resources but also has the challenge of terrorism and religious radicalism. *From the nuclearised conflict point of view, this region is least likely and is not being discussed any further in this study.*

West Asia. The strategic importance of West Asia lies in its geography and an essential natural resource, namely petroleum. Petroleum is the single most valuable commodity in world commerce, an indispensable item in times of peace and of critical strategic importance during war. India has a big stake in the region. Energy is the most obvious case in point. 70 per cent of India’s imported energy needs come from West Asia and this dependence will only increase as the Indian economy continues to grow at 8 per cent or more. The proposed pipeline with Iran thus makes good economic sense as does the Turkmenistan–Afghanistan–Pakistan–India pipeline. Yet another significant development in West Asia affecting India deeply is India’s relations with Israel. The relations have acquired a depth and diversity that cannot be rolled back.²² With Israel being a

de-facto nuclear power and Iran's aspirations to acquire nuclear weapons being an open issue, the region is fraught with tension. *The dyadic nuclear equations are Israel-Iran, Israel-Arab as well as the more generalized Iran-Arab equation.*

Clubbing of South Asia and North East Asia. The nuclear equations that emerge and which effect India profoundly straddles across South Asia as well as North East Asia and these are:

- ▶ Indo-Pakistan Nuclear Equation.
- ▶ Pakistan-China Nuclear Equation.
- ▶ Indo-China Nuclear Equation.
- ▶ China-Myanmar Nuclear Equation.
- ▶ The triangular equation of India-Pakistan-China.
- ▶ The profound influence of the USA in each of the above equations.

Issues for Analysis

This study undertakes an analysis of the emerging contours of a nuclearised conflict in Asia from an Indian perspective. Asia is fast emerging as the centre of gravity of the global political, economic and military power in parallel with what many view as the progressive diminution of Western hold and dominance over global affairs. India is an emerging power in Asia and events in the continent will inevitably affect India. So while Asia is emerging as the catalyst for the transformation of the global balance-of-power and the consequent changes in the global strategic calculus, the possible causes of tensions could well escalate and result into a conflict. Given the reality that Asia is home to five nuclear armed nations, the shape that the conflict may take is important to determine so that India is eminently prepared.

In analyzing the geopolitical reconstruction of Asia, five key trends defining the past decade have been kept uppermost²³:

- ▶ The ongoing rise of China.
- ▶ The slow and gradual beginning of the rise of India.
- ▶ The relative weakening of the US.
- ▶ The ongoing contest over defining an Asian regional identity.
- ▶ The emergence of balancing against China.

As brought out earlier, this study delves on the nuclear equations between various countries of Asia in so much as they effect India. With that in view the study analyses:

- ▶ South Asia and North East Asia together, since no meaningful analysis of South Asia is possible without considering China.
- ▶ West Asia in a more generalized manner only.
- ▶ The emerging nuclear weapon states in Asia.

The sophisticated subject of nuclear deterrence has been subjected to a great deal of intense academic scrutiny in the western world right through the Cold War period. While it is not the purpose to repeat these again, Chapter 2 of this study relooks at some of these aspects, particularly with an aim of drawing conclusions with respect to the peculiar situation existing in Asia. This is

important so that suitable lessons are imbibed with respect to the ever evolving nuclear environment in Asia. While the perception in India is that nuclear weapons are for deterrence against nuclear weapons and as a weapon of last resort for retaliation only, Chapter 3 of the paper explores the rationale of nuclear weapons including the doctrine and strategy of the other nuclear powers of Asia. While volumes have been written about this, the study examines the recent developments and salient changes that seem to be creeping in the declared doctrine and strategies. Also the impact that these changes may have on the contours of conflict have been analyzed. Currently, mixed signals appear to be emanating from both China and Pakistan. While a few of the comments can be understood to be merely for their domestic consumption, when provocative statements are issued by the persons holding public office, this gives cause for serious concern. To illustrate, the recent reports suggesting that China is not averse to first use of nuclear weapons against a nuclear state are worrisome²⁴. With regard to Pakistan, the reports that it is amassing nuclear warheads at a feverish pitch are a cause for deep concern. As are the reports that Pakistan is also developing tactical nuclear warheads. Is Pakistan moving towards nuclear war fighting? What is the doctrine of use of nuclear weapons of Korea and Israel? Do they also believe that these are for deterrence only or will they actually use it in a conflict scenario? Since this study is unabashedly from an Indian view point, what about India's Nuclear Doctrine. Is it robust enough to cater to all contingencies? Are any changes needed? What, if any, will be the effect of a Ballistic Missile Defence? The study has attempted to answer these worrisome questions.

In Chapter 4, the aspect of the so-called nuclear thresholds has been examined. Will nuclear weapons or threat of nuclear weapons be used at the first instance? Or will it follow a gradual and predictable escalatory ladder? India is living in a relatively turbulent environment. Some strategic thinkers have described it as a "hostile" neighbourhood. It is an undisputable fact that apart from Bhutan, relations of India have been decidedly 'reserved' at most times and 'frosty' at others with the other nations. While the smaller neighbours are not a threat, the same cannot be said about the nuclear weapon states of China and Pakistan. The causes of discord are many and while efforts to resolve these peacefully are underway, the lurking danger that this may escalate is very real. In the case of China, the pin pricks of the thorny border issue are yet to be resolved. While most strategists believe that a conventional conflict with China is unlikely in the near or medium term there is a long term threat from China.

In the case of Pakistan, the chances of a conventional conflict do exist. There are a large number of issues where there is divergence of opinion; the prime area of discord is the vexed issue of cross border terrorism. The study examines the threshold levels of India. Will India react to another 26/11 type of terrorist incident? Will that result in a conventional conflict? If so, what is likely to be the contours of such a conflict? It is an irony that while nuclear weapons do succeed in deterring major conflicts between two nuclear weapon states, paradoxically, they also give rise to sub-conventional conflict. Acting on the assumption that nuclear weapons confer a degree of protection from conflict escalation, certain states may be or are tempted to adopt sub-conventional warfare techniques. Since the study is from an Indian perspective, South Asia naturally forms the fulcrum of study and effects of conflict in the other regions on India have been analyzed. The role of nuclear weapons in these conflicts, both historically and empirically, has been examined. The role of nuclear weapons has been taken to encompass aspects of nuclear blackmail and nuclear diplomacy too.

The aspect of No First Use has been proclaimed by China and it has pledged not to use it against a non nuclear weapon state. In the light of this declared policy, the possible provocation for use of

nuclear weapons by China has been discussed. The logic of use of nuclear weapons by Israel and North Korea has also been briefly covered in this Chapter.

In Chapter 5 the history the nuclear equations in Asia have been examined. In South Asia, the dyadic nuclear relationship between India-Pakistan, India-China as well as China-Myanmar has been analyzed. Also the three way relationship between India, Pakistan and China has also been covered. Similarly, in North East Asia the nuclear equation between a de-facto nuclear power, North Korea and the extended nuclear deterrence of the USA has been examined. In West Asia the ramifications of a nuclear Israel on regional security has been covered.

In Chapter 6, the past crisis has been analyzed as well as an effort made to indulge in a little bit of crystal ball gazing. In the South Asian context, the efficacy or otherwise of nuclear weapons in the past crisis has been critically studied. Aspects of nuclear blackmail and nuclear diplomacy have also been covered. An effort has also been made to briefly analyze future scenarios in South Asia as well as West Asia.

In the final chapter, the study has analyzed various measures that are needed to be taken to make the strategic environment in Asia more stable. The study has focused on certain nuclear risk management measures as well as considered the vexed issue of terrorism which can conclusively be linked to a neighboring state. Is the response to a gruesome terrorist attack really limited to only rhetoric and protests through diplomatic channels and bringing intense international pressure or is there a window open to prosecute conventional military operations? If such a window is indeed available, how big is the window? Will it escalate into a nuclear conflict if prosecuted to its logical conclusion? What steps, if any, can India take to enlarge this window? Is self deterrence the only hindrance? The question of the war being limited has also been briefly explored. The study concludes that, as a long term option, India must continue with its effort towards a Nuclear Weapons Free World.

¹ John H Herz, "Idealist Internationalism and the Security Dilemma" World Politics, vol 2(1950).

² RK Khilnani "Nuclearisation in South Asia", Commonwealth Publishers, New Delhi, 2000, p-8.

³ Maj Gen GD Bakshi (Retired) "Limited Wars in South Asia", KW Publishers, 2010, p 10.

⁴ In the period 2007-09, there has been a revival of interest in nuclear disarmament triggered by the realization that nuclear weapons in the present security context are more of a liability than an asset. Some of the recent notable initiatives in this direction are the efforts being spearheaded by the Nuclear Threat Initiative's Nuclear Security project led by George Shultz, Henry Kissinger, William Perry and Sam Nunn, the Global Zero Project initiated by Bruce Blair, the Australian-Japan Commission and an effort by UK to examine the verification challenges for disarmament. Also an Informal group under the Congress MP Mani Shankar Aiyar has worked on this in India and recently submitted a report.

⁵ Dr Manpreet Sethi, "Nuclear Deterrence in Second Tier Nuclear Weapon States: A Case Study of India", Occasional Paper published by Centre 'de Sciences Humaines, New Delhi, in December 2009.

⁶ The Copenhagen School has advocated this for long. See Barry Buzan, People States and Fear: An Agenda for International security in the post cold war era (New York: Harvester -Wheatsheaf, 1991)

⁷ Dipankar Banerjee, Security Studies in South Asia: change and challenge(New Delhi: Manohar, 2000)

⁸ 'Asian security environment and choices for India' By Dr. Subhash Kapila. *SYNERGY*, Journal of the Centre for Joint Warfare Studies, New Delhi, January 2010.

⁹ Robert D. Kaplan, "The India-China Rivalry", *Stratfor*, 25 April 2012.

¹⁰ Dr Subhash Kapila op. cit

- 11 E Sridharan, "International Relations Theory and the India-Pakistan Conflict", in E Sridharan edited, "The India-Pakistan Nuclear Relationship", Routledge, 2007.
- 12 Ibid.
- 13 "Delhi's Pacific Ambition: Naval Power, 'Look East', and India's Emerging Influence in the Asia Pacific", Walter C. Ladwig III, *Asian Security*, Vol. 5, No. 2, 2009, pp. 87-113.
- 14 Looking East: India and Southeast Asia* G. V. C. Naidu, Research Fellow, Institute for Defence Studies and Analyses, India
- 15 'Asian security environment and choices for India' By Dr. Subhash Kapila
- 16 United Nations Cartographic Section Web Site, United Nations Statistics Division accessed at <http://www.un.org/Depts/Cartographic/english/htmain.htm>
- 17 Eric Schmitt and Declan Walsh "U.S. Takes Step Toward Exit in Pakistan Talk" 11 June 11, 2012, *The New York Times*.
- 18 'Leaked Cables Point to North Korean Work in Myanmar' *Global News Service*, Friday, Dec. 10, 2010
- 19 'Understanding China and India : Security Implications for the United States and the World' Rollie Lal. Westport, CT: Praeger Security International, 2006.
- 20 'India and Central Asia' By Nadkarni V Paper presented at the annual meeting of the International Studies Association 48th Annual Convention, Hilton, Chicago.
- 21 'India and Central Asia' Rahul Bedi, *Frontline*, Volume 19 - Issue 19.
- 22 Ambassador Rajendra Abhyankar "India and West Asia" Distinguished Lecture Series on India's Foreign Policy.
- 23 Barry Buzan, "The Geopolitical Reconstruction of Asia: A Reflection Ten Years on from Regions and Powers," *Politique Etrangère*. Accessed at depts.washington.edu/polsadv/.../Buzan%20Seattle%20paper.doc
- 24 "China rethinks no-first-use policy", *The Hindustan Times*, 07 January, 2011 accessed at <http://www.hindustantimes.com/world-news/RestOfAsia/China-rethinks-no-first-usepolicy/Article1-647213.aspx>

Nuclear Deterrence

Birth of the Deterrence Theory

Deterrence theory was born historically in 1764 as part of the classical criminology's quest for a more humane alternative to torture and hanging. It probably cannot be fully understood without going back to the writings of Cesare Beccaria (1738-1794) and Jeremy Bentham (1748-1832). In International Relations (IR), deterrence is closely related by definition to the possibility of conflict. As such, it has existed in one form or another ever since human societies first clashed with one another. In that context, it is logical and reasonable for a State to seek to deter a potential adversary from attacking it by developing a military capacity that would make the costs of such an attack too high in comparison with any possible advantages. That basic policy has always existed and could possibly continue to exist as long as human nature remains the same. This does not mean, however, that it will not present problems if carried beyond certain limits, to the point where it becomes unacceptable to the rest of mankind. Deterrence is a universal phenomenon that operates across cultures, across technologies, and across millennia.

Salient Aspects of Deterrence Theory

Cesare Beccaria, an eighteenth-century philosopher, was among the first to conduct information gathering on the correlation between the imposed punishment of crimes and the compliant behavior of society. He concentrated on criminal behavior and believed that criminal decisions were based on a few simple factors:

- ▶ The first being that humans have free will (they have the power to act upon their own accord);
- ▶ The next is that humans are rational creatures and able to weigh prospective outcomes of their actions, seeing which may benefit or detract from the quality of their lives;
- ▶ Human decisions are based on the simplest views of man (primarily, pleasure is preferable over pain);
- ▶ Finally that an organized system of laws and punishments which catered to these human traits is necessary to help keep society compliant.

While Utilitarianism is an ethical theory holding that the proper course of action is the one that maximizes the overall "happiness", Cesare Beccaria evaluated the effect of "punishment" on the actions of a human being. His theories fall into the Rational Choice School and are closely related to rational choice itself, the logic being that humans always consider their actions and weigh the pros and cons as it relates to them before acting. Based on this, two branches of deterrence theory were developed: General Deterrence and Individual Deterrence. Both of these are of more relevance and applicability in the field of criminology.

General Deterrence. The concept of general deterrence is the most proactive of all as it seeks to target potential crimes before they happen. This branch of theory is a starting point in the deterrence continuum and often targets the crime in general and not the offender. General deterrence does so by issuing blanket knowledge that if one commits a crime then there will be punishment. It is the going about of issuing a law and making it known that a particular act is not permitted, and that there will be consequences should one commit such an act. An easy everyday example of general deterrence at work is the presence of CCTV cameras in many department stores, ATMs and grocery stores. These electronic devices deter a potential offender. General deterrence is aimed at the general public.

Individual Deterrence. Instead of being aimed at the general public and deterring crime in a general manner, it is used to target new offenders. For example first time offenders are generally given a more lenient punishment and repeat offenders are meted out with exemplary punishment. The aim is to prevent repeat offenders and to achieve this; the punishment has to be sufficiently harsh so as to *actually* deter the repeat offender.

Subsequently, theorists added two more major types of deterrence to the fray; these are Absolute Deterrence and Restrictive Deterrence. One thing to keep in mind is that deterrence is a very difficult concept to measure as it produces no solid, tangible, primary results. All results seen from deterrent methods are dependent upon something else (secondary). In other words, the lack of a conflict implies success of deterrence.

Absolute Deterrence. The perceived '*non-necessity*' of a nuclear defence force gave rise to the strategy of "Absolute Deterrence". While deterrence is the state where State B wouldn't attack State A because he's wary of the consequences, absolute deterrence is when State B doesn't dare to attack State A because it is aware that it is not worth the price. This was thought to be a condition that is in direct contrast to the "Balance of Deterrence" situation. Balance of deterrence being a situation in which the incentives on both sides to initiate war are outweighed by the disincentives; it is described as stable when it is reasonably secure against shocks, alarms and perturbations.

Restrictive Deterrence. This is when an offender simply reduces the seriousness or frequency (λ) of their criminal involvement.

Evolution of Nuclear Deterrence

"What is impressive is not how complicated the idea of deterrence has become, and how carefully it has been refined and developed, but how slow the progress has been, how vague the concepts still are, and how inelegant the current theory of deterrence is".

-Thomas C Schelling, "The Strategy of Conflict", in 1960

It is truly amazing that the thoughts of Thomas Schelling, one of the best-known arms control experts, is as relevant today as it was more than five decades ago. The early thoughts on nuclear deterrence emerged in examining the assumptions underlying the inevitable surprise attack during hostilities. The nuclear bomb was looked upon as a super-weapon which unquestionably gave the possessor nation a decisive offensive capability, out of this arose the doctrine of nuclear deterrence.

It needs to be acknowledged that tremendous effort has been made to prevent the use of nuclear weapons during the Cold War period. The strategic concept which dominated this perpetual effort thus has been dominated by the “*concept of deterrence*”. Deterrence has a pristine simplicity; the threat of a nuclear attack is negated by the possibility of nuclear reprisal in kind.

The basic elements of nuclear strategy which thus began to emerge were the following:

- ▶ Impossibility of defence.
- ▶ Vulnerability of cities.
- ▶ Attraction of sudden and successful attacks.
- ▶ Retaliatory capability.

Despite this, the concept of nuclear deterrence has remained a highly contentious issue; it gives rise to a host of questions:

- ▶ How large does the retaliatory threat have to be?
- ▶ Does the character of the nuclear threat-counterforce, counter value, limited, unlimited affect the quality of deterrence?
- ▶ Is the certainty of retaliation necessary for deterrence?
- ▶ Will the mere possibility be sufficient?¹
- ▶ If deterrence fails, how to fight a nuclear war and with what objectives?

This broadly is the deterrence paradigm and the defence intellectuals of the Cold War period devoted themselves to solving this without coming to any satisfactory conclusion. At the root of all the thought processes regarding deterrence, the following are a few assumptions²:

- ▶ Nuclear war is not ‘winnable’ because the likely cost (death and destruction) would exceed the likely gains. Thus rational calculations by rational decision makers will inevitably lead to war avoidance, particularly if the two sides are aware of the irrationality of launching nuclear strikes against an equally strong nuclear adversary.
- ▶ War avoidance necessarily becomes the over-riding objective and purpose of deterrence. It is to be achieved by means of maintaining sufficient capabilities and a firm and clear resolve to use these capabilities.
- ▶ The model of deterrence stability, the key objective of deterrence policies and its management derive primarily from game theory, which prescribes the proper strategies for rational decision making in conflict/cooperation contexts where the acceptable, though not necessarily preferred outcome depends on tacit bargaining and cooperation by the players and where winning often involves the acceptance of the best of worse outcome, that is minimizing strategies.

Herman Kahn early on distinguished three types of deterrence according to the kinds of threats faced and goals sought³:

- ▶ **Type-I.** Is the deterrence of direct attack, under certain strategic doctrines it would call for automatic response.
- ▶ **Type-II.** Is defined as “using strategic threats to deter an enemy from engaging in very

provocative acts, other than a direct attack.....”

- ▶ **Type-III.** Graduated or controlled deterrence, referring to the acts that “are deterred because the potential aggressor is afraid that the defender or others will then make the aggression unprofitable”. It might be called tit-for-tat, graduated or controlled deterrence.

Regarding types of responses, Kahn offered three “conceptualized devices”:

- ▶ **Doomsday Machine.** An automatic world destruction response to Type II or Type III provocations by an adversary.
- ▶ **Doomsday in a Hurry Machine.** Alerting prospective attackers that an attack will trigger Doomsday in response to specified Type II or Type III provocations.
- ▶ **Homicide Pact Machine.** An automatic world destruction response to direct Type I nuclear attack.

Classical deterrence theory is seen as describing situations in which mutual insecure conditional viability occurs⁴. Robert Jervis on the other hand has identified three waves of contemporary deterrence theory:

- ▶ **First Wave.** Came immediately after the Second World War in the work of such writers as Bernard Brodie, Arnold Wolfers and Jacob Viner and grew out of a desire to examine the consequences of the advent of the nuclear weapon.
- ▶ **Second Wave.** By the late 1950s, including the works of Brodie, Kahn, Schelling, Glenn Snyder and Albert Wohlstetter. It had grown and received considerable attention in comparison to the first wave. This second wave exploited the heuristic value of game theoretic treatments and explored the implications of deliberately “irrational” behavior in a rational model framework. This wave was strongly identified with the foreign policy of containment. However, it offered little or nothing about how to modify the motivations of opposing players. It tended to be focused on interactions of high conflict potential or immediate deterrence situations, to the exclusion of general deterrence. It has also been criticized as biased in favor of status quo powers⁵.
- ▶ **Third Wave.** Gained prominence in the 1970s by raising other criticisms. For example under the doctrine of Mutually Assured Destruction (MAD), deterrence ought not to work for at the heart of the rational theory of deterrence is the assured irrationality of incurring one’s own destruction in order to retaliate.

The logic of the deterrence stability paradigm seemed to imply that any significant effort to modify or change it was doomed to defeat. The deterrence paradigm thus became an end game, a trap and there was no way to avoid it because there was no realistic ideas as to how and with what to replace it. The doctrine of deterrence was sustained by the intellectual reasoning of “living with nuclear weapons” logic. Richard Falk referred to the political advantage of deterrence in his characteristic style:

“Deterrence has become as entrenched as an approach not because it has objective merits as the best means to avoid war, but because it alone reconciles nuclearism and the state system in an age of technophilia. Its hyper-rationality is in the last analysis, an ingenious rationalization for the international status quo”⁶.

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