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India's Emerging Land Warfare Doctrines and Capabilities

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ABSTRACT

Maintaining India's territorial integrity and its social and economic well-being have been the country's principal national security concerns. Lately, the country's foremost security concern has been to resist overt and covert acts of terror. Securing these vital national interests and aspirations requires preservation and protection against external and internal threats. India's rising international stature and economic clout are likely to make increasing demands on the country's armed forces in times to come. The Indian armed forces therefore need to suitably equip, train and prepare themselves to tackle a range of external and internal threats. Qualitative changes currently underway in military organization, doctrine, technology and culture could significantly transform India's conventional war-fighting capabilities over the next decade or so. The paper argues that the Indian Army can be expected to adapt itself well to emerging threats and challenges, and deter or, if necessary, defend the country against China, and achieve sufficient combat superiority vis-à-vis Pakistan, in the medium to long term. India's army can be expected to emerge as an important security provider in the region, with sufficient force projection capabilities to pursue its legitimate interests in the neighbourhood, and even beyond.

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India's Emerging Land Warfare Doctrines and Capabilities

Introduction

The Indian armed forces, like those of other sovereign states, are mandated to defend India's territorial integrity and maintain internal order and security. The Indian armed forces have thus far met these challenges with professionalism and ensured that the core values of the nation are preserved. The role of the armed forces is likely to increase with India's rising international stature and economic clout. Accordingly, the Indian armed forces would need to suitably equip, train and prepare themselves to meet a range of external and internal threats. Qualitative changes currently underway in military organization, technology, doctrine and culture could significantly transform India's conventional war-fighting capabilities over the next decade or so.

This paper aims to identify India's emerging land warfare doctrines and qualitative changes underway in its war-fighting capabilities in the light of extensive combat experience gained in recent decades. The paper is organized into five sections:

- The geo-strategic environment and the critical security challenges facing India in the foreseeable future
- The land-war fighting doctrine and capabilities necessary to counter the emerging challenges and threats
- The evolution of India's land warfare doctrine and capability development
- The challenges and concerns in terms of force structuring and capability development
- The likely strategic impact that India's land forces could have in the region in terms of conventional and sub-conventional capabilities

The paper concludes that the Indian Army can be expected to adapt itself well to the emerging threats and challenges, and deter or, if necessary, defend the country admirably against China, and achieve sufficient combat superiority vis-à-vis Pakistan, in the medium to long term. India's army can be expected to emerge as an important

security provider in the region, with sufficient force projection capabilities to pursue its legitimate national interests in the neighbourhood and even beyond.

The Context and Scope

The Indian armed forces are the fourth largest fighting force in the world.[1] The Indian Army's active strength is pegged at 1,100,000 men with a reserve component of around 960,000 men.[2] Since India's independence in 1947, the army has acquitted itself with distinction in several armed conflicts and confrontations. Its contribution in safeguarding the national territorial interests in Jammu and Kashmir (1947–1948), the amalgamation of the Hyderabad state (1948), the liberation of Goa (1961), the Indo-China conflict (1962), the Nathu La skirmishes (1967), the two Indo-Pak Wars (1965 and 1971) and the Kargil intrusions (1998) are well catalogued. Besides these, the army has been deployed to tackle insurgencies and internal unrest, and it has all through played a significant role in stabilizing the situation in its north-east and Jammu and Kashmir.[3]

The army has contributed immensely towards advancing India's image in the international arena, as a major troop-contributing nation, in the UN peacekeeping operations.[4] It has been involved in providing large-scale humanitarian assistance during natural disasters and calamities within the country and abroad. Major relief operations include the tsunami catastrophe of 2004, Hurricane Katrina in the United States (2005), the evacuation of Indian citizens during the Israel-Lebanon conflict (2006), Cyclone Nargis in Myanmar (2008), and the Wenchuan earthquake in China (2008). The two military interventions, to implement the ill-fated Indo-Sri Lanka Accord in 1987, and the restoration of the elected Maldivian government in 1988,

[1] The Military Balance 2009: The International Institute for Strategic Studies (IISS). It comprises an active and reserve component of 1,281,200 and 1,555,000 all ranks respectively.

[2] Ibid. The first line reserves comprise around 300,000 falling within five years of full service and further commitment of 500,000 till the age of 50.

[3] Brig Gurmeet Kanwal (Retd.) phrases the Indian Army's role over the several decades since independence as "custodians of peace" in his book, *Indian Army Vision: 2020*, and further explains that its continual employment in external and internal conflict has earned it the sobriquet of "forever in battle".

[4] Major missions in which Indian troops have participated: Korea (1953–1954), Vietnam (1954–1970), Gaza (1956–1967), Congo (1960–1964), Cambodia (1992–1993), Mozambique (1992–1994), Somalia (1993–1994), Angola (1994–1997), Rwanda (1995–1996), Sierra Leone (1998–2000), Lebanon, DRC and Sudan.

were no less important. The latter is often cited as an instance of diplomatic and military success.

Extensive combat experience gained in the 1980s and 1990s has contributed immensely to the evolution of India's land warfare doctrines and capabilities. Prominent among these have been the army deployments in Siachen glacier, Sri Lanka, Punjab, Assam and Kashmir. In addition, several decades of exposure to peacekeeping operations and increased opportunities of international military exchange and training have added to army's overall efficiency and perspective. The operational experience of the Indian Army has indeed been vast and merits detailed examination.

The Geo-strategic Environment

Rise of Asia: There has been much recent discussion about the rise of Asia.[5] The eastern half of the Eurasian land mass, with an arc of islands to its southeast, has emerged as the new global centre of gravity.[6] This steady shift has been widely documented by political analysts and commentators.[7] For instance, Kishore Mahbubani asserts that Asian countries are briskly absorbing the western practices, innovation and technology, because of which it is likely that by 2050 the world's three largest economies will be in Asia i.e. China, India and Japan.[8] Fareed Zakaria argues that economic growth is creating a new global landscape where power and wealth are shifting from the well-known and prosperous states to lesser known countries such as China, India, Brazil, Russia and South Africa, described in his words as the "rise of the rest".[9] According to Robyn Meredith, the rise of China and

[5] Friedberg, Aaron L., "Introduction", in *Strategic Asia: Power and Purpose; Expanded Executive Summary; The National Bureau of Asian Research*, 2001–2002; p. 17–18).

[6] Ellings, Richard J., Preface, in *Strategic Asia: Challenges and Choices*, 2008–2009; p ix. The Strategic Asia Programme of the National Bureau of Asian Research considers Asia to be the entire eastern half of the Eurasian land mass and the arc of offshore islands in the western Pacific. This vast expanse can be pictured as an area centred around China and consisting of four distinct regions arrayed clockwise around it: Northeast Asia (including the Russian Far East, the Korean Peninsula and Japan), Southeast Asia (including both its mainland and maritime component), South Asia (including India and Pakistan and bordered to the west by Afghanistan), and Central Asia (Kazakhstan, Kirgizstan, Tajikistan, Turkmenistan, Uzbekistan and Southern Russia).

[7] Friedberg, Aaron L., "Introduction" in *Strategic Asia: Power and Purpose; Expanded Executive Summary*, National Bureau of Asian Research; 2001–2002, p. 17. Aaron L. Friedberg, citing the Angus Madison's percentage share of world GDPs from 1820 to 2015 had suggested way back in 2001 that the centre of gravity of the international system was gradually shifting from western to eastern Eurasia.

[8] Mahbubani, Kishore, "The New Asian Hemisphere: The Irresistible Shift of Global Power to the East", *Public Affairs*, 2008.

[9] Zakaria, Fareed, *The Post-American World*. W.W. Norton & Company, 2008.

India could shape a new world order and international politics in the near future.[10] But the Asian continent has also to contend with a number of contentious socio-economic and political issues ranging from slow economic liberalization to indifferent political democratization, competitive regional politics to global power politics, and deep ethno-national-religious divisions within and between the countries.

Regional dynamics: The United States Quadrennial Defense Review (QDR) 2010 states that "the rise of China, the world's most populous country, and India, the world's largest democracy, will continue to shape an international system that can no longer [be] easily defined".[11] It is apparent that the relative economic power of countries such as China and India has substantially increased, while that of Japan and Russia has declined.[12] At another level, Japanese, Indian and Russian planners worry about the Chinese economic growth and rise of their military might. The Chinese in turn fear encirclement by a strategic alliance between the United States and Japan (and lately India). Some analysts argue that the rise of these new global players and the challenges they pose to the United States' strategy could be quite wide-ranging and difficult. A few predict that the Chinese could even eclipse their primacy in the foreseeable future. Accordingly, the United States is attempting to build strong bilateral relationships with China and India at several levels.[13] But it is obvious that this strategic engagement will be leveraged by the United States to preserve its influence in the region.[14]

China's economic rise: China's brisk economic growth has raised the stakes for global competition in terms of capital formation, capacity building and military capabilities.[15] Its military modernization has raised concerns at the regional and global level. In retrospect, several countries in Asia while economically engaging with China are upgrading their conventional military capabilities to cope with growing strategic

[10] Meredith, Robyn, *The Elephant and the Dragon: The Rise of India and China and What It Means for All of Us*, W.W. Norton & Company, 2008. She argues that China has successfully transformed itself into a "manufacturing" juggernaut while continuing to wave the banner of communism, and India too despite its governance woes has been fairly successful in steering the domestic economy to greater heights especially in the field of IT services and pharmaceuticals industry.

[11] Executive Summary, *Quadrennial Defense Review Report 2010*, p. iii.

[12] Friedberg, p. 19.

[13] Ellings, Richard J., Preface, *Strategic Asia: Challenges and Choices*, 2008–2009; p. ix.

[14] Tellis, Ashley J., *Preserving Hegemony: The Strategic Tasks Facing the United States*, 2008–2009; p. 3.

[15] Ellings, p. ix.

uncertainties in the region.[16] The defence strategies adopted by different countries are reflective of their specific threat environment/s, security perceptions and military capabilities.[17] Besides, there are enough strategic incentives for countries within the region to acquire nuclear weapons.[18] Six of the eight declared nuclear weapon states are in Asia. And above all, the unresolved territorial and boundary disputes could create precarious politico-military situations, where inadvertent miscalculations or irrational behaviour could spark off a conflict between the nuclear states.

India in the New World: India's growing international stature and economic clout places an increasing demand on its armed forces.[19] In the context of India's growing influence, the QDR 2010 states that, "as India's economic power, cultural reach and political influence increase, it will assume a more influential role in global affairs and world politics".[20] Undoubtedly, India's strategic challenge would be to secure its economic, territorial and energy interests, in the wake of China's rise and the possible decline of the United States. Interestingly, the QDR 2010 also observes that,

> **"India's military capabilities are rapidly improving through increased acquisitions, which include long-range maritime surveillance, maritime interdiction and patrolling, air interdiction, and strategic airlift … and it has already established its influence through counter-piracy, peacekeeping, humanitarian assistance, and disaster relief efforts … and as its military capabilities grow, India will contribute to Asia as a net provider of security in the Indian Ocean and beyond."[21]**

The era of globalization presents an opportunity to enhance India's strategic interests both at home and abroad. But then the country needs to undertake significant internal reforms to deal with the changing geo-strategic environment and develop appropriate security structures that would enhance its role and leverage.

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[16] Tellis, Ashley J., "Military Modernisation in Asia", in *Strategic Asia: Military Modernisation in an Era of Uncertainty*", Expanded Executive Summary, The National Bureau of Asian Research, 2005–2006.

[17] Ibid.

[18] Reiss, Mitchell B., "Prospects for Nuclear Proliferation in Asia", in *Strategic Asia: Military Modernisation in an Era of Uncertainty*, Expanded Executive Summary, The National Bureau of Asian Research, 2005–2006.

[19] Baldev Raj Nayar and T. V. Paul, *India in the World Order: Searching for Major-Power Status*, Cambridge: Cambridge University Press, 2003.

[20] *U.S. Quadrennial Defence Review*, February 2010, p. 60.

[21] Ibid.

Implications in the military context: India's grand strategy is gradually evolving and making significant strides. Emerging strategic partnerships with the United States, Russia, France, Japan and other countries, expansion of trade with China and ASEAN, new initiatives in Africa, developmental efforts in Afghanistan, maritime cooperation in the Indian Ocean Region (IOR) and its firm stand on issues of global consequence such as nuclear disarmament, trade and climate change highlight its increasing influence at a global level. In this context, India's long-term security needs cannot be seen merely in terms of resolving its long standing territorial and boundary disputes. Other factors that need to be taken into account are the dangers arising from nuclear proliferation, the presence of extra-regional and potentially hostile powers, and the growth of conventional and nuclear capabilities of inimical powers in the region. In addition, the land warfare and maritime dimensions, insurgencies and internal security, humanitarian assistance and disaster relief, and mandated UN peacekeeping deployments, will continue to engage India's armed forces.

India's Critical Security Challenges

India occupies a predominant geo-strategic position in South Asia. The country shares its land borders with six countries: China, Bangladesh, Myanmar, Nepal, Bhutan and Pakistan, a total of approximately 14,863 kilometres.[22] The extended land borders coupled with a long coastline of 7,863 kilometres, and an equally large economic zone presents a formidable security challenge. India's territorial and maritime security concerns are accentuated by cross-border terrorism, non-state and trans-national actors, illegal migration, drug trafficking and organized crime. This section attempts to analyse some of the critical security challenges and threats that India faces now and is likely to encounter in the foreseeable future.

- **Border management**: The employment of security forces along India's extensive land and sea frontiers compounds the internal security problem.[23] Issues of uneven efficacy and organizational control among the myriad security agencies remain.[24]

[22] Brig Gurmeet Kanwal, *Indian Army Vision 2020*, Harper Collins Publishers, New Delhi, 2008, pp. 90–91.

[23] Ibid. p. 95.

[24] Brig. R. K. Bhonsle (Retd.) argues that border management and internal security as challenges should now be taken on by the central paramilitary forces given their growing numbers, and capabilities which will come gradually. In his view, this would enable the Indian Army to focus on dissuasive and deterrent tasks. E-mail dated 07 May 2010.

It is thus axiomatic that the poor management of the country's borders has led to volatile internal security situations. Gaps in border security have contributed to the rise of insurgency in the border states of Jammu and Kashmir, Punjab and the North East in the past. The long and porous borders with countries such as Bangladesh, Myanmar and Nepal have allowed illegal cross-border migration and the movement of terrorist groups. In the case of Bangladesh, the issue of Indian enclaves within Bangladesh and vice versa remains particularly sensitive. Similarly, sporadic Chinese intrusions continue despite the many confidence-building measures undertaken in Arunachal Pradesh and eastern Ladakh. Chinese intransigence in exchanging maps to lay claim to Indian territories further complicates the issue. In the west, infiltration by Pakistan-abetted terrorist groups continues to be an irritant.

- **Internal security**: India has witnessed various shades and hues of internal unrest, secessionist insurgencies and armed rebellions since its independence.[25] Early insurrections have been in Telangana and Naxalbari, followed by the insurgencies in the North East and wanton acts of terror in the states of Punjab and Assam. In recent times, the menace of left wing extremism, commonly referred to as Naxalism and Maoist insurgency, has been characterised as the single biggest challenge to India's internal security. It spans some 16 states in the Indian mainland. Over time, there has been a steep increase in its spatial spread, the incidence of violence and indoctrination of the naxal cadres.[26]

- **Continental threats**: The continuing collusive nexus between China and Pakistan poses a strategic challenge to India. China is known to have provided direct technical assistance to Pakistan for its nuclear weapons programme.[27] In the past, Chinese leaders have even claimed that their friendship is "higher than the

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[25] S. Kalyan Raman, "The Challenge of Terrorism", http://www.india-seminar.com/2009/599/599_s_kalyanaraman.htm , accessed on 10 February 2010.

[26] P. V. Ramana, "A Critical Evaluation of the Union Government's Response to the Maoist Challenge", *Strategic Analysis*, Vol. 33, No. 5, September 2009, pp. 745–759.

[27] China has helped Pakistan to build a reactor to produce weapons grade plutonium at the Chashma nuclear facility. It has transferred M-9 and M-11 ballistic missiles as also facilitated in the clandestine transfer of Taepo Dong and No Dong missiles from North Korea to Pakistan.

mountains and deeper than the oceans".[28] Though some impression of stability prevails at the strategic level, China continues to exhibit marked political, diplomatic and military assertiveness at the tactical level.[29] China and India have failed to resolve their boundary dispute since the war in 1962.[30] Border patrol face-offs are frequent, and an armed clash or skirmish if not contained, could lead to a local conflict. In recent years, the westward expansion of Chinese railway and road infrastructure in the Tibetan Autonomous Region accentuates India's concerns with regard to their military intentions. Indian forces, therefore, have to be sufficiently prepared to defend against China and Pakistan in the mid-to-long term.[31]

- **Maritime concerns**: The IOR is also critical to the country's security in terms of trade, energy needs, protection of island territories and exploitation of the EEZ.[32] This strategically significant oceanic region characterized by narrow navigational channels to its east and west can be easily interdicted or disrupted.[33] In fact, the littoral spread is critical for the smooth flow of oil, raw materials and trade for several countries. The Indian Army can be expected to play an important role in supporting the Indian navy in its objectives, missions and tasks.[34] The need to evolve comprehensive and combined security measures for protection of India's isl**a**nd territories and littorals will assume greater importance in the future.

- **Emerging and disruptive technologies**: The potential exploitation of emerging technologies such as nanotechnology, biotechnology, information technology and dual use innovations by adversaries with malicious intent is yet another cause for

[28] The analysis is based on a talk delivered by Brig. Gurmeet Kanwal (Retd.) to South Asia Programme in February 2010 at S. Rajaratnam School of International Studies, Nanyang Technological University, Singapore.

[29] Ibid.

[30] Despite 16 rounds of talks between China and India, the Line of Actual Control (LAC) is yet to be demarcated.

[31] Gill, John H., "India and Pakistan: A Shift in the Military Calculus", in *Strategic Asia: Military Modernisation in an Era of Uncertainty*, Expanded Executive Summary, The National Bureau of Asian Research, 2005–2006).

[32] Indian Maritime Doctrine 2009, pp. 57–58. A substantial part of India's industrial and economic activity is located within the EEZ, along the 7,516-kilometre long coastline. India's EEZ is 2,013,410 square kilometres in area, which is equal to 66 per cent of the land mass, to which another 530,000 square kilometres is likely to be added as an extension to the continental shelf.

[33] The primary choke points are the Persian Gulf, St. of Hormuz, Bab-el-Mandeb, Cape of Good Hope, Mozambique Channel, Six-degree channel, Eight/Nine-degree Channels, Straits of Malacca and Singapore, Sunda Strait and Lombok Strait.

[34] Indian Maritime Doctrine 2009, pp. 89–122.

concern.[35] The adverse impact of such capabilities, if trans-national and non-state actors have them, is becoming increasingly evident. Exploitation of asymmetric capabilities by adversaries in the form of technologies ranging from innocuous explosive devices to more wide-ranging cyber attacks and electronic warfare, battlefield robotics and precision munitions, and long-range guided missiles could have serious military implications for India in the future.

Implications on capability development: India's security challenges and threats will therefore continue to be shaped by regional powers and in particular China, trans-national terrorism and religious fundamentalism, social and ethnic upheavals, and low intensity conflicts. The challenges and threats posed are likely to be complex and could manifest themselves in several forms. The major armed threats to India shall nonetheless continue to be those from Pakistan and China. Though full-scale wars are less likely to take place, short and sharp conflicts cannot be ruled out. In the sub-continental context, such limited conflicts and confrontations could give way to trans-border acts of terrorism, ethnic strife and externally sponsored insurgencies.[36] Some have argued that as India grows economically strong, the focus of external security concerns will increasingly shift "seawards", besides the fact that the nuclear environment would considerably diminish the political space for military action.

Nevertheless, the Indian Army will still have to maintain a credible conventional deterrent against potential adversaries and appropriate force structures to counter acts of terror and insurgencies.[37] Building technological capabilities in terms of long-range precision-guided missiles and munitions, unmanned aerial vehicles, cyber and electronic warfare capacities and network centric systems would be essential to complement the overall conventional war-fighting capabilities in order to retain a decisive edge on the battlefield.[38] Clearly the need to evolve or reconcile existing service specific and joint doctrines and strategies to combat the diverse challenges and threats at land, sea and air is assuming greater importance.

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[35] http://www.rsis.edu.sg/cens/publications/conference_reports/RSIS_ICEDT%20Report_171109.pdf

[36] Lt. Gen. Vijay Oberai, "Approach Paper" in *Army 2020: Shape, Size, Structure and General Doctrine for Emerging Challenges*, edited by Lt. Gen. Vijay Oberai (KW Publishers Pvt. Ltd, New Delhi, 2005), p. 14.

[37] Ibid.

[38] Vice Admiral P. S. Das, "Contours of India's Emerging Security Environment", in *Army 2020: Shape, Size, Structure and General Doctrine for Emerging Challenges*, edited by Lt. Gen. Vijay Oberai (KW Publishers Pvt. Ltd, New Delhi, 2005), p. 57.

Matching Capabilities with Aspirations

India aspires to be recognized as an economic power of some consequence. The fundamental requirement for unhindered socio-economic growth is an environment of peace and stability. This, in turn, requires putting in place appropriate military strategies and measures to reduce the risk of war and deter potential adversaries. The primary concern of any government in power will be the prevention of an armed conflict, be it conventional or sub-conventional, regular or irregular, full scale or limited.[39] This section attempts to explicate the key national security concerns and objectives; the emerging nature of conflict, the likely battlefield milieus; and the role of land-warfare components in pursuit of India's long-term national interests and aspirations.

National security concerns: India's national foreign policy and security objectives have evolved against a backdrop of its core values of democracy, peaceful co-existence, secularism and equitable socio-economic development.[40] Maintaining India's territorial integrity and resisting covert or overt acts of terror to ensure its continued economic growth have become the country's prime security concerns.[41] India's Ministry of Defence states that continued presence of terrorist and fundamentalist forces in its neighbourhood among other land and maritime threats prompts India to maintain a high level of defence preparedness.[42] The prevailing security environment can be contextualized at four fundamental military planning levels:

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[39] Air Cmde. Jasjit Singh, "Synchronising Military Power with National Aspirations", in *Army 2020: Shape, Size, Structure and General Doctrine for Emerging Challenges*, edited by Lt. Gen. Vijay Oberai (KW Publishers Pvt Ltd, New Delhi, 2005), p. 93.

[40] For a detailed study of India's foreign policy and national security concerns, see J. N. Dixit, *India's Foreign Policy: 1947–2003* (Picus Books, New Delhi, 2003).

[41] Refer to the Ministry of Defence (MoD) webpage, "Security Environment – An Overview", retrieved at http://mod.nic.in/aforces/body.htm#. The Ministry of Defence defines the basic responsibility of the Indian Army as one of safeguarding the territorial integrity of the nation against external aggression. In addition, the army is required to assist the civil administration during internal security disturbances, and in the maintenance of law and order, organizing relief operations during natural calamities like floods, earthquakes and cyclones and maintenance of essential services if required.

[42] MoD further emphasizes that India's core security concerns include defending the country's borders; protecting the lives and property of its citizens against war, terrorism, nuclear threats and militant activities; protecting the country from instability and religious and other forms of radicalism and extremism emanating from neighbouring states; securing the country against the use or the threat of use of weapons of mass destruction; development of material, equipment and technologies that have a bearing on India's defence preparedness through indigenous research, development and production, inter-alia to overcome restrictions on the transfer of such items; promoting further co-operation and understanding with neighbouring countries and implementing mutually agreed confidence-building measures; and pursuing security and strategic dialogues with major powers and key partners. (Accessed on 6 March 2010).

- Firstly, the Indian armed forces have a two-front obligation which requires them to safeguard their borders with Pakistan and China.

- Secondly, since India is not a member of any military alliance it must possess an independent deterrent capability.

- Thirdly, the continued external abetment of cross-border terrorism demands that the armed forces remain committed to internal security duties on a relatively larger scale.

- And fourthly, India's interests in the IOR highlight the need for a blue-water capability which is commensurate with its national interests and responsibilities.

Military imperatives: To ensure durable peace and security, the country needs to maintain a credible and affordable defence capability. In this context, there is a need to grapple with two conflicting demands i.e. prevention of war through conventional and nuclear deterrence, and the creation of military capabilities for the defence of the nation should deterrence fail. And if deterrence were to fail, the country must possess the requisite military capability to prosecute war that affords maximum political advantage at minimum cost, and in the shortest time possible. This calls for an appropriate war-fighting potential which is adequate to deal with adversaries, and flexible enough to deal with diverse sub-conventional challenges and threats, while remaining affordable and cost effective.[43] A few military imperatives, therefore, merit attention.

- **Scope**: Wars must be limited in scope and time to avoid uncontrolled escalation and associated risks of destruction.[44] While deterring war will be the primary aim, the armed forces must be prepared and ready to fight short and swift wars. Military campaigns will have to be concluded in tune with political aims and objectives, and with the least number of casualties. Conventional military operations are therefore likely to be reduced to creating a favourable political situation so that post-conflict negotiations and mediation can take place.[45] The

[43] In the Indian context, it is generally hypothesized that an investment of around three per cent will continue to provide affordable security in the twenty-first century.

[44] Air Cmde. Jasjit Singh, "Dynamics of Limited War", in *Strategic Analysis* Vol. XXIV, No 7, IDSA, pp. 1205–1220.

[45] Brig Gurmeet Kanwal, *Indian Army Vision 2020*, Harper Collins Publishers, New Delhi, 2008, pp. 62–63.

prevailing nuclear environment also dictates that large-scale offensive action aimed at defeating the enemy is scaled down.

- **Nature of conflict:** Future conflicts would be driven by technology and innovation, and marked by high rates of attrition, physical degradation and casualties. Introduction of force multipliers and new weapon systems, battle sensors, communications and networks would define the nature of conflict.[46] There will be an increased emphasis on real-time surveillance and target acquisition, integrated command and control systems, networks and communications, cyber and electronic warfare, and lethal precision-guided munitions.[47] Proliferation of asymmetric capabilities such as guided missiles, unmanned aerial assets and robotics could drastically alter the dynamic of future wars. The emerging environment would demand efficient and flexible combat and support organizations, which will have to be prepared to fight wars, ranging from conventional to sub-conventional operations, and that too in a nuclear setting.[48] Importantly, the future battlefield environment would necessitate significant levels of inter- and intra-service integration in terms of planning and application of force.

- **Conflict in the nuclear backdrop**: India has been living in a nuclear neighbourhood for a long time. China is rapidly modernizing its nuclear weapons and delivery systems to include medium to long-range ballistic missiles and the MIRV capabilities can have a devastating destructive effect.[49] Pakistan, with the tacit support of China, has been successful in acquiring a nuclear strike capability. Pakistan's nuclear policy, as its leaders have often emphasized, is to counter India's conventional military superiority.[50] The military leadership has repeatedly argued that, "in a deteriorating military situation … it will be left with no option

[46] Lt. Gen. Vijay Oberai, "Approach Paper", in *Army 2020: Shape, Size, Structure and General Doctrine for Emerging Challenges*, edited by Lt. Gen. Vijay Oberai (KW Publishers Pvt. Ltd, New Delhi, 2005), p. 15.

[47] Ibid.

[48] Lt. Gen. V. K. Kapoor, "A Perspective on Force Re-structuring and Doctrinal Challenges", in *Army 2020: Shape, Size, Structure and General Doctrine for Emerging Challenges*, edited by Lt. Gen. Vijay Oberai (KW Publishers Pvt. Ltd, New Delhi, 2005), p. 221.

[49] China's Second Artillery Corps, now re-christened the "Strategic Rocket Wing", comprises a range of conventional and nuclear tactical weapons that can be deployed at short notice.

[50] Brig Gurmeet Kanwal, *Indian Army Vision 2020*, Harper Collins Publishers, New Delhi, 2008, p. 35.

but to use nuclear weapons"[51] and, "to defeat the break up of the nation … it must have a declared strategy of using nuclear weapons".[52] The civilian leadership, too, has made similar pronouncements to warn India that it has a low-nuclear threshold.

Role and tasks: The Indian Army doctrine of October 2004 defines its role at two levels: primary and secondary security concerns.[53] The primary role is defined as the preservation of national interests by safeguarding India's sovereignty and integrity against external threats. The secondary role entails rendering assistance to cope with low-intensity conflicts and other internal security threats, as and when requisitioned. The doctrine lists a series of tasks for its envisaged operational role.

- Firstly, the Indian Army should be able to deter and dissuade potential adversaries by building strong conventional land war-fighting capabilities.
- Secondly, the land force should be able to plan and conduct operations across the entire spectrum of conflict.
- Thirdly, it should be prepared to provide aid to the civil authorities, as and when called for, in preservation of law and order, during disasters and calamities or any other circumstances including maintenance of essential services.
- Fourthly, it should be prepared to participate in the UN peacekeeping missions in consonance with India's commitment to the prescribed mandate.
- Lastly, it has to be prepared to render military assistance to friendly foreign countries, if required to do so.

The Indian Army's future role and tasks have also been spelled out in their personal capacities by several former Chiefs of Army Staff and retired generals.[54] The major

[51] Lt. Gen. SFS Lodhi, "Pakistan's Nuclear Doctrine", *Pakistan Defence Journal*, 1999.

[52] Brig Ismat Saeed, "Strategy for Total Defence: A Conceptual Nuclear Doctrine", *Pakistan Defence Journal*, March 2000.

[53] Brig Gurmeet Kanwal, *Indian Army Vision 2020*, Harper Collins Publishers, New Delhi, 2008, p. 59.

[54] Salient explanations are summarized: Roy Chowdhury, Shankar, "Indian Army 2020", *Indian Defence Review* Vol. 19, No. 4, Oct – Dec 2004, pp. 36–42. General Shankar Roy Chowdhury argues that the world will continue to remain an uneasy place and the Indian Army would require land warfare capabilities to operate across the entire spectrum of conflict. He asserts that over the next decade or so, the role of the Indian armed forces will remain unchanged, and shall continue to focus on protection of India's territorial integrity by land, air and sea. While acknowledging the need to maintain individual service identities and aspirations, he opines that there is a need to organize, equip and train the Indian Army, in conjunction with the Indian Air Force and Indian Navy, to fully exploit its combat potential and utility in future conflicts; Padmanabhan, S, "Indian Army 2020", *Indian Defence Review* Vol. 20, No. 4, Oct – Dec 2005, pp. 37–46. General S. Padmanabhan explains the Indian Army's role in context of the

thrust of their views conforms to those outlined in the Indian Army doctrine. A few visualize a larger regional role, where the land forces are able to deploy and protect India's national interests at home and abroad by building sufficient force projection capabilities.[55]

Desirability of land force capabilities: The Indian Army will have to be optimally equipped to operate across the entire spectrum of conflict. To effectively undertake the assigned roles and tasks, the Indian Army would need conventional capabilities for fighting high-intensity wars on the one hand to tackling insurgencies on the other.[56] The salient land war-fighting capability needs are likely to be as follows:

- **Conventional**: It would perhaps be pertinent to note that regardless of the emerging threats and challenges, India's conventional land war-fighting capabilities will remain important. This would imply maintenance of required combat superiority against a belligerent Pakistan, and sufficient deterrence to discourage China from undertaking any revisionist designs. The actual combat strength would depend upon the evolving military capabilities and behaviour of each of these adversaries, and these would have to be balanced in light of the overall resource availability. Besides a numerical expression of force levels required for each theatre, there would be a need to identify the qualitative requirements in terms of weapon systems and support platforms required for desired "effect" on the battlefield.[57]

- **Sub-conventional**: The Indian Army also needs to have the capacity to support the sub-conventional demands of the nation, without unjustifiably diluting its

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primary and secondary tasks. He argues that the Indian Army should be capable of "deterring external aggression by an adversary, and if deterrence fails, defeat it by force". In the secondary role, the army should be able to "assist the government in overcoming internal threats, foreign-sponsored or indigenous, and aid the civil authorities when requisitioned".

[55] Lt. Gen. V. K. Kapoor visualizes a larger regional role for the Indian Army and argues that the land-force component should be able to "protect its sovereign rights, protect its people at home and abroad, preserve and maintain free trade".

[56] The middle segment of the land-force component will continue to be populated by conventional forces comprising infantry, armour, mechanized infantry, artillery, air defence, army aviation, and backed up by requisite combat support engineers and communications and logistical elements for sustenance in the field.

[57] Lt. Gen. V. K. Kapoor, "A Perspective on Force Re-structuring and Doctrinal Challenges", in *Army 2020: Shape, Size, Structure and General Doctrine for Emerging Challenges*, edited by Lt. Gen. Vijay Oberai (KW Publishers Pvt. Ltd, New Delhi, 2005), p. 225. The author lists a host of military technologies and best practices necessary to bring in the required qualitative combat edge. These include digitized communication networks linking forward deployed sensors to the weapons, ground and airborne surveillance assets deployed through an array of manned and unmanned aircrafts, precision guided munitions, digital mapping and spatial updating, fully networked and lean logistics, rapid means of transportation and force mobilization and effective individual and crew body gear and protection.

conventional edge. These could include tackling a range of sub-conventional threats such as cross-border terrorism and festering insurgencies, as well as assisting the paramilitaries and state police forces in containing internal unrest.[58] These concerns underline the need to create and train sufficient counter-insurgency and counter-terror forces to include the fielding of Special Forces.[59] The raising of 60-plus Rashtriya Rifles battalions for counter-insurgency operations has made an immense contribution in enhancing India's sub-conventional doctrines and capabilities. Sub-conventional threats reinforce the need to build appropriate surveillance capacities and communication networks for timely dissemination of intelligence and precision in surgical strikes.

- **Non-traditional**: The Indian Army has constantly maintained a large complement of troops to support UN peacekeeping missions. It fields a huge complement of officers and men to staff the several mission headquarters and field-observer teams. Its practical experience in the planning and conduct of peacekeeping operations is fairly extensive. In the past decade or so, it has developed strong institutional capacities to enable timely and tailored deployment of UN contingents ranging in size from an infantry battalion to a brigade group with a full complement of mission-specific logistical and administrative needs. This wide exposure has enhanced its understanding on non-traditional military roles and enabled it to imbibe the best practices that govern the handling of large-scale humanitarian relief effort and assistance. In time to come, this experience could well be translated into viable force projection capacities for state re-construction efforts in other turbulent parts of the world.

A credible conventional capability is an overriding condition to deter external threats. India's extensive land borders with China and Pakistan, and maritime and littoral interests, demand that the army maintains an optimal force posture in the medium-to-long term. The army's role in fighting some of India's simmering insurgencies will

[58] Brig. R. K. Bhonsle, "India's National Aspirations and Military Capabilities 2020: A Prognostic Survey", in *Army 2020: Shape, Size, Structure and General Doctrine for Emerging Challenges*, edited by Lt. Gen. Vijay Oberai (KW Publishers Pvt. Ltd, New Delhi, 2005), p. 141.

[59] Bharat Karnad, "Firming up the Critical Capability Triad", in *Army 2020: Shape, Size, Structure and General Doctrine for Emerging Challenges*, edited by Lt. Gen. Vijay Oberai (KW Publishers Pvt. Ltd, New Delhi, 2005), p. 247. It is argued that the Special Forces are the "only solution for a problem" that is afflicting the country for several decades and "a meaningful and multi-purpose force capable of deploying by air or sea and to begin with an equivalent of two divisions" is relevant in the current context.

also remain important. This dictates the need for maintenance of suitable force structures both at the conventional and sub-conventional level. In addition, the Indian Army also needs to preserve its peacekeeping capacities, as therein lies the framework for creating force projection capabilities for non-traditional challenges in the future. Building of requisite technological capabilities of such medium-to-long-range guided missiles, theatre air defence, cyber and electronic warfare, unmanned aerial assets, etc., would also be essential to provide the cutting edge on a modern battlefield.

Doctrinal Evolution and Capability Development

Doctrinal evolution: The Indian armed forces have seen considerable doctrinal change in the past decade or so. The Indian Air Force (IAF) was the first service to release its operational doctrine in 1995.[60] The Indian Army introduced its new war-fighting doctrine in 2004, which seeks to alter the basic approach to war by leveraging advanced technology to fight short duration conflicts in a nuclear environment.[61] Later in the same year, the Indian navy released its maritime doctrine, which set out a road map for a blue-water role for its fleet.[62]

As India seeks to play a larger regional role, the doctrinal evolution in the armed forces and consequently the capability development assumes great significance.[63] The salient aspects of the doctrine are as follows.

- **Conventional operations:** Most defence doctrines revolve around two common warfare methods: attrition and manoeuvre. Attrition is largely focussed on destroying the enemy's strength, while manoeuvre is about breaking the enemy's will and organizational cohesion. Some scholars have claimed that the Indian

[60] Rahul Bedi article entitled, "Indian Air Force draft doctrine envisions broader role", at http://www.janes.com/news/defence/air/jdw/jdw070816_1_n.shtml.

[61] For a detailed overview of India's land war fighting doctrine see Walter C. Ladwig, The challenge of changing military doctrine, http://india-seminar.com/2009/599.htm (accessed on March 01, 2010). Indian Army

[62] For a detailed overview of India's maritime doctrine see. Cmde Ashok Sawhney (Retd), RSIS Working Paper No 127 titled, India's Naval Effectiveness for National Growth, Singapore, 07 May 2010., p. 22-24.

[63] A military doctrine provides the basic framework and principles that shape the way in which the armed forces are employed to achieve the national objectives. For a detailed study on the subject, refer to the occasional paper entitled, "The Origins of Contemporary Doctrine", edited by John Gooch, The Strategic and Combat Studies Institute, UK, September 1997. Also see Adelphi Paper No. 109 entitled, 'The Alliance and Europe: Part IV Military Doctrine and Technology' by Steven Canby, IISS, UK, 1974.

Army's posture has fundamentally been defensive and attrition-oriented.[64] They argue that the Indian Army is organized, equipped and trained only for "defensive or pre-planned offensives to attrite the enemy's strength through tactical engagements".[65] Clearly these fail to take into account the country's territorial concerns and boundary sensitivities.

Pakistan's support to militancy and repeated acts of terror led to a full-scale mobilization in 2001. The realization that future conflicts could be "incident" driven led to new operational thinking as stated in the doctrine of 2004. The new doctrine lays emphasis on manoeuvre. By manoeuvring the forces to unpredictable locations at high speeds and faster than the opposing forces, the battle groups would seek to disrupt enemy formations on the battlefield.[66] How the new doctrine helps in achieving India's broader national security concerns in a nuclear neighbourhood has been an issue of some discussion.[67] Some experts argue that the new doctrine is a risky proposition, and its implementation would have major ramifications for strategic stability in South Asia.[68] Others have argued that the doctrine may prompt Pakistan to increasingly rely on its nuclear arsenal in self-defence.[69]

- **Counter-insurgency operations:** India has been engaged in combating internal threats since independence. It has adopted different approaches for each situation and evolved principles, guidelines and procedures to deal with a wide range of

[64] Walter C. Ladwig, "The challenge of changing military doctrine", http://india-seminar.com/2009/599.htm, accessed on 1 March 2010.

[65] Also see Ladwig, "A Cold Start for Hot Wars? The Indian Army's New limited War Doctrine", *International Security*, Vol. 32, No. 3, 2007–2008, pp. 158–190, and his paper entitled, "Cold Start: India's New Strategic Doctrine and its Implications", at Naval Postgraduate School, Monterey, CA, May 2008.

[66] Brig Gurmeet Kanwal argues that the doctrine essentially dictates shallow territorial gains with integrated battle groups for post conflict negotiations with Pakistan. The land force operations require integration with IAF for close air support in order to speed up the tempo of operations.

[67] Lt Gen VK Sood and Pravin Sawhney, *Operation Parakram: The Unfinished Agenda* (Sage Publications; New Delhi; 2003) p. 170. See pages 153–156 on the new operational thinking as analysed by the authors. In an interesting account, the two authors assert that, "the army's new thinking necessitates an aggressive and proactive posture. [And therefore] it requires a restructuring of the security instruments to provide versatile and balanced forces, greater induction of technology, greater flexibility in force levels and organizations and inter-services coordination". Since future wars would be short and intense, the case for air-land battle capabilities is also argued.

[68] http://www.idsa.in/idsacomments/IndiasColdStartDoctrineandStrategyStability_gkanwal_010610.

[69] Col. Ali Ahmed (Retd.), "Pakistan Nuclear Use and Implications for India", *Strategic Analysis*, Vol. 34, Issue No. 4, July 2010. The author argues that Pakistan may further lower its nuclear posture to deter India from undertaking a conventional military strike.

internal threats.[70] Experts believe that policies in the post-independence era were influenced by two factors: the Nehruvian thinking[71] and lessons drawn from the Malayan insurgency of 1950–1957.[72] Nehru abhorred the overwhelming use of force and insisted on civilian primacy over military action in counter-insurgency operations. The early army operations in containing the Nagas and the Mizos were tempered by this political concern, and were in several ways responsible for shaping India's counter-insurgency doctrine.[73]

The Indian Army's doctrine on sub-conventional operations issued in 2006 marked the codification of this long-standing experience and practice.[74] The document can be seen as a logical extension of the conventional war-fighting doctrine issued in 2004. The doctrine focuses on the principles and practices best suited for sub-conventional operations, and including counter-terrorism and low-intensity conflicts. Prior to this, the doctrinal tenets were addressed through a series of departmental training manuals and publications.[75] The period also saw the raising of counter-insurgency specific forces namely the Assam Rifles (AR) and the Rashtriya Rifles (RR) which were deployed in the North East and Jammu and Kashmir respectively.[76]

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[70] Dipankar Banerjee, "The Indian Army's Counterinsurgency Doctrine", in *India and Counterinsurgency Lessons Learned*, edited by Sumit Ganguly and David P. Fidler, Routledge Taylor and Francis Group, London, 2009, pp. 189–206.

[71] Rajesh Rajagopalan, *Restoring Normalcy: The Evolution of the Indian Army's Counterinsurgency Doctrine*, pp. 48–49.

[72] The Indian Army drew several lessons from the Malayan campaign: firstly of countering insurgency under a unified command mechanism; secondly, segregating the populations from the insurgents; and thirdly, winning of hearts and minds of the local populace.

[73] Rajesh Rajagopalan, "Insurgency and Counterinsurgency", http://www.india-seminar.com/2009/599/599_rajesh_rajagopalan.htm , accessed on 10 February 2010. Rajesh Rajagopalan opines that India's counterinsurgency campaigns have been characterized by five main features: firstly, the military operations complement the larger political grand strategy; secondly, the civilian and military hierarchy emphasizes the limitation on use of force; thirdly, the pattern of operations focuses on securing the populace through troop intensive operations; fourthly, it does not rely heavily on small team operations and lastly, the military effort is limited to creating conditions for resumption of the political dialogue.

[74] Dipankar Banerjee cites three major reasons for articulation of this doctrine: firstly, the document clarifies the limits and characteristics of the use of force in non-conventional operations; secondly, it draws a relationship in the role played by civilian and military leadership; and thirdly, it enables designation of priorities for resource allocation, equipment acquisition and training activities in the long term.

[75] These were largely compiled based on operational experiences and innovations codified by the Counterinsurgency and Jungle Warfare School (CIJWS). The CIJWS has been at the forefront of training of Indian Army units deployed for counterinsurgency operations. It has emerged as a major centre of excellence and trains troops from a number of foreign countries in South and Southeast Asia, some African countries, and the United States.

[76] In the early 1990s, the Indian Army created a dedicated counterinsurgency force, the Rashtriya Rifles (RR). The original purpose was to create a new paramilitary force but one stiffened with army officers, which would relieve the Indian Army of its counterinsurgency duties. When it was finally established, the RR became a fully-manned army and equipped force, in contradiction to its original purpose. This 60-plus battalion force today forms the bulk of the counterinsurgency component deployed for operations in Jammu and Kashmir.

In a comparative study of Indian and U.S. counter-insurgency practices, David P. Fidler argues that since the two countries are likely to increasingly confront sub-conventional threats, the development of two doctrines is significant.[77] In the case of the United States, the relevance lies in outlining the approach for its current operations in Iraq and Afghanistan, while in the case of the Indian Army, it is simply a case of codifying the past experience. Sumit Ganguly and David P. Fidler assert that India's counter-insurgency experience is far too rich to be reduced to an easy synthesis.[78] India has managed to find the right combination of political action and military pressure to manage levels of violence.[79]

The Indian doctrine has been evolving steadily over the past decade or so. It not only elucidates on India's conventional and sub-conventional military doctrines but also explains how it looks at future wars and conflicts. The fact that the land forces shall continue to play an important role in the overall national security framework is reinforced by our long-standing disputes with China and Pakistan and insurgencies. India needs to maintain a credible land-force component for its territorial defence and a tailored force to tackle the internal security situations, which lie beyond the traditional capacities of central paramilitaries and state police forces.

Capability development: Military doctrines can be credible only if backed by commensurate capabilities. India's Ministry of Defence asserts that only "a pragmatic vision of the shape, size and role of the [Indian] army" can make the modernization process dynamic and oriented towards the development of a "threat-cum-capability"-based force.[80] Accordingly, it needs to prepare for a multitude of continental threats, and to that extent is always "ready and relevant".

In the past decade and a half, three major provocations from Pakistan including the Kargil intrusions of 1999, the attack on the Indian Parliament in 2001 and the 26/11 attacks in Mumbai brought the two countries close to war. These episodes clearly emphasize the need to maintain a high level of operational readiness. However,

[77] David P. Fidler, "The Indian Doctrine for Sub-Conventional Operations", in *India and Counterinsurgency Lessons Learned*, edited by Sumit Ganguly and David P. Fidler, Routledge Taylor and Francis Group, London, 2009, pp. 207–224.

[78] Ibid.

[79] Sumit Ganguly and David P. Fidler, "Conclusion", in *India and Counterinsurgency Lessons Learned*, edited by Sumit Ganguly and David P. Fidler, Routledge Taylor and Francis Group, London, 2009, pp. 225–229.

[80] *Annual Report 2008–2009*, Ministry of Defence, Government of India, p. 22.

India's efforts to modernize its land forces have been frequently thwarted due to inadequate resource commitments. The combat edge that India enjoyed along its western borders has recurrently degraded due to lack of focussed development of capabilities.[81] Several factors account for the lack of adequate capabilities.

- First, serious limitations in budgetary priorities and processes, and a labyrinthine bureaucracy impede effective military capability development and technological innovation.

- Second, the systemic inefficiencies in the acquisition process have led to large time-and-cost overruns.[82] These, in turn, have affected the overall operational preparedness of the armed forces.

The current equipment deficiencies especially in terms of state-of-the-art mechanized weapon platforms, artillery pieces and air defence guns, and guided munitions and missile systems are glaring and need to be addressed in the short-to-medium term. [83]

- **Main battle tanks**: In 2000, India negotiated a deal to acquire T-90S tanks to replace its ageing tank fleet. Subsequently, India began to assemble these tanks and has recently acquired a few hundred T-90S tank CKD to assemble them within the country. The indigenously developed Arjun MBT has been in the pipeline for nearly two decades and to date a bulk order of only a few tanks has been placed for manufacture.

- **Artillery guns**: Many analysts argue that the artillery modernization plan has suffered acutely since the last major acquisition of 155-mm FH-77B howitzers from Bofors of Sweden in the mid-1980s. A global tender has been floated for purchase of 155-mm towed artillery guns to be followed by indigenous

[81] S. Paul Kapur, *Dangerous Deterrent: Nuclear Weapons Proliferation and Conflict in South Asia*, Oxford University Press, 2008, p. 23. The calculation of combat ratios is based on four parameters: military manpower, tanks, aircraft and defence spending aggregated for each year and thereafter averaged for the period under consideration. An interesting analysis of the conventional edge between the two countries reveals that the combat ratio roughly averaged 2.65:1 during the non-nuclear period (1972–1989), declined to 2.1:1 during the de-facto nuclear period (1990–1998) and rose slightly to 2.51:1 during the overt nuclear period (1998–2002). Interestingly, the incidence of military disputes between the two countries based on the Correlates of War (COW) project data set were five times more frequent from 1990 to 2002, at approximately 0.76 disputes per month, as compared to the period between1972 and 1989.

[82] http://www.idsa.in/idsacomments/DefenceAcquisitions_HSingh_031209. The cost overshoots stood at 8 per cent in the case of United Kingdom as compared to 25 per cent for United States. But then United States delivered the planned projects with an average delay of 25 per cent as compared to 32 per cent in the case of United Kingdom.

[83] http://www.india-seminar.com/2009/599/599_gurmeet_kanwal.htm. The status of modernisation reflected under this paragraph is summarized from the paper presented by Brig. Gurmeet Kanwal (Retd.). In some cases, additional data and details from other open domain sources have been cited.

manufacture. A request has also been issued for self-propelled guns for deployment of mechanized forces in the plains and semi-desert terrain. Some pieces of 130-mm M46 Russian medium guns have also been up-gunned to 155-mm calibre in collaboration with Soltam of Israel. In addition, a lightweight towed howitzer weighing less than 5,000 kg has been issued for use by the mountain divisions.

- **Weapon-locating radars**: The counter-bombardment capability in terms of introduction of high-end weapon-locating radars is also being addressed. A few ANTPQ-37 Fire finders WLR were procured from Raytheon in 2002, but these are inadequate for effective surveillance along both the fronts – China and Pakistan.

- **Long range missiles**: The Brahmos supersonic missile with cruise speed of Mach 2.8 to 3.0 and precision strike at a range of 290 kilometres has been quite a success story. The missile is a terrain-hugging projectile and virtually immune to counter action because of its high-speed and low-radar signature, and is extremely versatile in terms of its ability to launch from land, air and sea.

- **Air defence missile systems**: The annual defence report states that, in terms of air defence equipment, the priority is to "acquire and replace vintage air defence missile systems; find a common successor for air defence gun systems; enhance the surveillance and fire-control capabilities by procuring three dimensional tactical control radars and a successor of existing fire-control radars".[84] It is obvious that the preparedness of the air defence systems has suffered seriously in recent decades. Besides gaps in the air defence weapons coverage, India is handicapped in terms of radar coverage as well. In particular, the air defence needs of the mechanized forces are a major area of concern. The SAM-6 and SAM-7 missile systems, which have been the backbone of the Indian Army's strike formations since the 1970s, also need an urgent replacement. Similarly the Tungushkas, OSA-AKs and Shilka air defence systems are ageing and inadequate to provide high-quality low-level air defence cover to the field formations. The

[84] *Annual Report 2008–2009*, Ministry of Defence, Government of India.

DRDO ventures of AKASH and TRISHUL missile systems have not made much headway and there is a need to look for suitable alternatives.

- **Infantry weapon systems**: The modernization of infantry weapon systems, too, needs urgent attention in the light of its large-scale commitment for border management and internal security tasks. The army has lately initiated the Future Infantry Soldier as a System (F-INSAS) project which aims at equipping an infantryman as an all-terrain, networked, lethal, survivable soldier for the digitized battlefield of the future.[85] The Kornet-E anti tank guided missiles (ATGMs) with thermal-imaging sights have added to the capability of the infantry battalions. Similarly, the RR battalions have been equipped with surveillance and target acquisition devices and close quarter battle weapons to fight infiltrating columns and terrorists holed up in built-up areas. However, there has not been much progress in fulfilling the small arms requirements for conventional warfare. The INSAS 5.56-mm assault rifle, which has been in service for nearly 10 years, has not been found effective in performance. The LMG version is still facing teething problems and the close-quarter battle version has not found favour with the armed forces. The mechanized infantry is now equipped with BMP2 ICVs and several variants which are under development.

- **Communications and networks**: A network-centric battlefield information management system that synergises all surveillance sensors and shooters over a seamless communication network is most crucial for the army. While there has been qualitative improvement in communications at the operational level, the development and fielding of C4I2SR and TAC3I systems is lacking. Similarly, the integration of real-time satellite resolutions with networked platforms is yet to benefit the field commanders.

- **UAVs and PGMs**: Israeli Searcher-I and Heron unmanned aerial vehicles have since been introduced into service but these are too few in number to make any significant qualitative difference in real-time surveillance. The capability in mountains has recently been upgraded.

[85] http://www.indiastrategic.in/topstories66.htm

India's modernization programme is challenged by a range of threats faced by the country, and the requirement of fielding different force structures to confront these challenges. In addition, it would be the stiff competition between the services for scarce resources, which will decide future acquisition choices and outcomes.

Force Structuring and Doctrinal Challenges

Future wars and conflicts are likely to be limited in time and space. While deterring war will be the primary aim, the army must be prepared and ready to fight short and sharp conflicts. The emphasis in future conflicts will be on exploiting capabilities in an integrated fashion so as to dominate the entire battle space. In fact, fighting across the battle spectrum rather than engaging the enemy piecemeal will be the crux of any future operations. This would entail creating, maintaining and leveraging flexible land-force structures to enable rapid force mobilization, deployment and eventual employment on the battlefield. Some key challenges that affect the development of land-force capabilities are as follows:

- **Perspective planning:** Pursuant to recommendations made by the Group of Ministers Committee constituted in February 2001 on reform of the national security system, several important decisions have been taken.[86] These include the institution of a departmental mechanism in the form of the Defence Acquisition Council (DAC) to streamline the defence procurement process.[87] Another significant development has been the creation of the HQ Integrated Defence Staff (IDS) to enable joint planning on a range of issues affecting the three services.[88] Ever since then, the HQ IDS has been involved in developing a long-term integrated perspective plan (LTIPP) for the armed forces. LTIPP looks at the overall capability development over a 15-year perspective. However, some of these attempts continue to be hampered by inadequate resource committal and procedural stasis.[89]

[86] http://164.100.47.134/lsscommittee/Defence/14ls22ndreport.pdf & /32nd%20Report-ATR%20Kargil.pdf

[87] http://164.100.47.134/lsscommittee/Defence/6threp.pdf

[88] http://164.100.47.134/lsscommittee/Defence/36th%20Report-UNIFIED%20COMMAND.pdf

[89] Ibid.

- **Defence funding**: In the first decade and a half of its independence, India spent an average of 1.6 per cent on defence until the early 1960s, when the expenditure spurted to 3.8 per cent as a consequence of the disastrous 1962 Indo-China War. In the late 1980s, the defence budget again saw reasonable growth. Lately, the defence expenditure has once more fallen to less than two per cent, despite several assurances to maintain it at three per cent. A firm budgetary commitment with ability to roll forward unexpended defence allocation alone can ensure continued development of requisite land force structures and capabilities. The Indian Army's two-front obligations and internal security duties will continue to define the future land force requirements and modernization initiatives. How the Indian Army recasts its forces for the external and internal threats, and creates required capabilities are the key challenges that need to be addressed. The answer perhaps lies in creating indigenous capacities for research, development and production.

- **Research, development and production:** India has eight Defence Public Sector Undertakings (DPSUs) under the control of Department of Defence Production, Ministry of Defence (MoD).[90] These undertakings together with 40 Defence Ordnance Factories (OFs) form the backbone of India's defence production.[91] Unlike the OFs which produce low-end items, the DPSUs cater to the strategic needs of the armed forces.[92] The OFs in particular are responsible for manufacture of arms, ammunitions, armoured vehicles, and ordnance stores.[93] The organization has performed inadequately because of the below-par internal management of these factories, range of production, pricing of items, and their quality and delivery schedule. Various governmental reviews have recommended measures to energize the management of these factories, but so far not much has been done to corporatize them.[94] There is clearly a need to improve the efficiency of these

[90] http://164.100.47.134/lsscommittee/Defence/9threportof14th.pdf and /archive_reports.aspx?lsnum=14

[91] http://164.100.47.134/lsscommittee/Defence/7threp.pdf

[92] The items produced by DPSUs range from aircraft to helicopters, warships, submarines, heavy vehicles and earth movers, missiles, electronic devices and components, alloys and special purpose steel. In terms of value of production, DPSUs account for more than 65 per cent of the total industrial output of all defence public sector enterprises, including Ordnance Factories. Over the years, the undertakings have grown both in size as well as in their portfolio of items. However, the growth of DPSUs in terms of range and depth of production has not kept pace with the requirements of the armed forces. This is evident from huge arms imports made by India.

[93] http://164.100.47.134/lsscommittee/Defence/14ls20threport.pdf

[94] The reports of the committees are yet to be made public. The views expressed here are based on an interaction with Shri Laxman Behera, Research Fellow at Institute of Defence Studies and Analysis, New Delhi.

factories, which alone can ensure that the army's long-term capability needs are met. Improving indigenous competitiveness through increased participation of the private sector and foreign direct investment could go a long way in making up for the research, development and production deficiencies.[95] India needs to encourage and build its research, design and production capacities to meet the long-term organizational needs. This would also call for commensurate up-gradation and refinement in the defence acquisition processes.

- **Acquisitions and readiness:** The Indian Army with an active strength of 1.1 million personnel is the third largest land force in the world.[96] In the Tenth Plan (2002–2007), the army's modernization priorities were focussed on the infantry and Special Forces, night-fighting capabilities, and augmentation of surveillance equipment and artillery guns.[97] Currently the core areas are improvement in firepower and increased mobility, all-weather surveillance equipment and capabilities, night-fighting and firing capabilities, enhanced capability for the special forces, network-centric warfare and NBC protection.[98] However, the capability development is still slow and suffers from several institutional and procedural deficiencies. In terms of the procurement processes, there is an urgent need to graduate beyond the first generation reforms centred around "procedure-ization", and towards the timely delivery of capability needs. It is time to learn from the western experience on acquisition reforms, such as those outlined in the recent Bernard Gray report in the United Kingdom[99], and recommendations of the U.S. House of Representatives' House Armed Services Committee (HASC) on military readiness.[100]

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[95] http://164.100.47.134/lsscommittee/Defence/33rd%20Report-ID-PPP.pdf

[96] Eleanor Keymer, *Jane's World Armies*, Issue No. 24, p. 320.

[97] Lok Sabha Secretariat, 2nd Report of the Standing Committee on Defence, *Demands for Grants (2005–2006)*, p. 32.

[98] Government of India, Ministry of Defence, *Annual Report 2007–2008*, p. 16.

[99] http://www.mod.uk/DefenceInternet/AboutDefence/CorporatePublications/PolicyStrategyandPlanning/ReviewOfAcquisition.htm

[100] See the relevant section on US military readiness at http://armedservices.house.gov/oversight_plan.shtml

- **Force structures and doctrines:** India's ability to fight a one or two front war has been debated for quite some time. Conventional force levels with existing voids can enable only a single front engagement. This capability is partially eroded by troop commitments for counter-insurgency operations. In this context, the much argued reduction in conventional force levels is misplaced. It can take place, only if rapprochement with China gathers momentum, and the Kashmir issue is resolved. Since neither seems likely in the future, the operational necessity to maintain appropriate land-combat force levels for both fronts cannot be wished away. While the western front with Pakistan is substantially taken care of, the northern frontier lacks in strategic infra-structure and an adequate force posture. In that context, the raising of new mountain formations would make sense, as these would considerably enhance India's deterrent capability in the Himalayas.[101] In an era when future threats are difficult to predict, it is important to recast some components for a capability-based role. These network-centric, and air mobile or sea-borne forces could enable rapid deployment at home and abroad for humanitarian assistance and relief, and such other contingencies. Maintaining and sustaining a fair mix of threat and capability-based force levels is likely to be the primary organizational challenge faced by the Indian Army in time to come.[102] The need of the hour then is for a significant change in current military thinking, professional military education and organisational culture.

- **Culture, training and education:** The Indian Army is engaged in modernizing its forces with increased emphasis on mobility, firepower and battle-space awareness. The current environment and military theory calls for a transition from manpower intensive to a technologically capable force—in terms of network-centricity, manoeuvrability, lethality and survivability under adverse battle conditions. Greater reliance on technology and innovation would imply a corresponding shift in organizational culture, training and education. This would be crucial for developing combat skills and capacities capable of meeting the challenges of the future. Frequent foreign military exchanges and overseas deployment for peacekeeping operations have indeed contributed towards development of new organizational thinking and internal reform. There is also a need for greater

[101] IISS Strategic Comments, India arms for the future: Wider strategic horizons broaden defence procurements, Vol. 15, issue 1, February 2009.

[102] Annual Report 2008-09, Ministry of Defence, Government of India.

professional learning through formal academic rigour and professional military education. Exposure to strategic studies at universities and reputed think tanks at home and abroad could provide the much-needed impetus for development of doctrinal thought and change, technological inclination and infusion, and knowledge of best practices in capability development.

- **Civil-military relations:** Civil-military relations lie at the core of the national security framework and decision-making process. And in this respect, the Indian defence establishment needs to urgently grow out of its current stasis. While explicit political control over the military cannot be questioned, the need to involve the military as partners in the overall decision-making process is critical. Leveraging military knowledge, experience and capacities can only contribute to the larger well-being of the state. Clearly there is a need to strengthen the civil-military dynamic, to ensure that instruments of force are capable of responding to challenges and threats in the emerging environment. Cross-pollination of national security structures with defence expertise could pave the way for institutional equity, which in turn, could contribute towards the overall growth of strategic culture and operational thinking in India. In the short-to-medium term, it would entail the vertical and horizontal integration of the MoD and service headquarters, creation of a Chief of Defence Staff (CDS), representation of military staff in national security structures, leveraging military diplomacy, ensuring consistency in defence budgets, reforms in the acquisition process and defence industry and preparedness for a range of challenges and threats.

- **Inter- and intra-service integration:** The Kargil Review Committee (KRC) and Group of Ministers (GoM) report had stressed the need for defence reforms. Among other recommendations, they suggested the appointment of senior armed forces personnel of requisite expertise in the MoD, to make use of their operational experience in national security structures. This would enable effective decision making at the highest level, and also promote much-needed integration among the three services. Considering the fact that the key to success lies in integration of the three services, it is essential to have a CDS to provide single-point military advice. There is also a need to identify the common operational and logistical footprint among the three services, with a view to evolve shared and cost-effective joint practices. HQ IDS has made significant contribution to various

joint planning and procedures in the recent years. The Indian Army, too, is committed to leveraging combat strengths through mutual cooperation and common operating procedures. At yet another level, the army also needs to re-evaluate its teeth to tail ratio, and consequently progress towards maintaining a lean and mean war-fighting machine. The right-sizing of existing force structures alone can enable the Indian Army to recast some of its combat and combat-support components, to forge the additional capabilities it wishes to create for the twenty-first century.

The Indian Army has made significant strides in terms of doctrinal thought and capability development in the last decade or so. Future challenges and threats demand timely and precise application of force which make it imperative that all inhibitions and impediments to long-term doctrinal evolution and capability development are resolved at the earliest.

Likely Strategic Impact

India's defence forces are undergoing a major change as they modernize and seek to expand its influence in the region. Its military hardware needs are now being increasingly sourced from western countries rather than the former Soviet Union alone. There is also an increased emphasis on defence cooperation and training with other countries. Since 2001, India has increased its defence cooperation from seven to 26 agreements till the end of 2008.[103] As an emerging regional power, it continues to modernize its security forces to deal with potential threats that emanate from the neighbourhood and internal insurgencies, and fulfil its objective of being a lead nation in peacekeeping operations. In addition, the maritime challenges shall shape the security of peninsular India and far-flung island territories, and other littoral interests in the IOR.

Rich in experience ranging from high and rugged mountains to dense forests and jungles, to plains, semi-desert, desert, riverine and swampy terrain, the army's rank-and-file is extremely well-trained, battle hardened and innovative. It has, despite several institutional deficiencies, performed with extreme courage, perseverance and

[103] Brian K. Hedrick, India's Strategic Defence Transformation: Expanding Global Relationships, Strategic Studies Institute, U.S. Army War College, Carlisle, November 2009, p. 42.

dedication, and consistently undertaken roles and tasks well beyond its calling, and on occasions with insufficient resources. Its experience in handling a wide range of internal security situations has only been reinforced by frequent overseas deployment for peacekeeping operations.

It is quite clear that the army's military capabilities will only grow in time to come. The current trajectory of doctrinal evolution and capability development despite the structural and resource constraints promises significant growth. And therein lies the challenge and opportunities for future force structuring and capability development. The army will have to be increasingly modular in shape and size, and packaged to fight sharp and swift wars, and in response to diverse scenarios and operational environments. India, therefore, needs a mix of threat and capability based force structures to deter China and Pakistan, and to deal with other disruptive and asymmetric threats, limited force projection for peacekeeping duties, humanitarian assistance and state reconstruction effort at an international level.

The army needs to optimally exploit the available human and material resources to create flexible combat-force structures in the future. India's large civilian and technical competencies can surely enable the development of new concepts and professional best practices, which could ensure a quantum shift in levels of army's operational performance. Several modernization initiatives currently underway could result in the desired qualitative edge over the next decade or so. Increased budgetary allocations (in monetary terms alone) have contributed towards the design, development and fielding of several new war-fighting capabilities. Acquisitions in the pipeline such as the main battle tanks, towed and self-propelled guns, new generation of infantry-weapon systems, battlefield surveillance devices and improved communication networks would substantially improve the combat edge of the army in the near future and medium term, and serve as a deterrent for potential adversaries. These, coupled with substantial internal reforms, could pave the way for an efficient war-fighting component in the future.

In terms of the long-term strategic impact, the army will be a land force of some reckoning in the region. A well-equipped and manned army would be capable of committing sufficient combat-force levels both for traditional and non-traditional

tasks. This could include deployment of fairly large peacekeeping missions, stand-alone reconstruction efforts in strife-torn countries, as well as sufficient capabilities to manage natural disasters at home and abroad. The development of India's land war-fighting capabilities, while addressing its conventional deterrence and contingency-driven needs, will have to be sensitive to the fears and concerns in the neighbourhood. Strategic reassurance would help India build adequate confidence levels and strong relationship with these countries. India needs to constructively engage them and assuage their security and economic concerns. This alone could enable a stable neighbourhood, and which would enable India to focus on its major socio-economic challenges and development.

Conclusion

India's sphere of influence extends well beyond its immediate neighbourhood. This includes the northern part of the IOR extending from the Horn of Africa in the west to the Malacca Strait in the east, and several friendly countries in West, Central, Southeast and East Asia. India's strategic relevance and importance is pegged upon its continued political stability, socio-economic well-being and commensurable military might. Such an aspiration requires India to modernize its armed forces to meet the expanded military and non-military roles and tasks, which it may need to perform. This need to build military capabilities is compounded by its tenuous relationship with China and Pakistan, internal security situation, and the imperative of securing its littoral interests in the IOR.

The Indian Army will therefore have to be relevant and effective across the entire spectrum of conflict ranging from high-intensity conventional wars under a nuclear backdrop to low-intensity conflicts. The future battlefield will become increasingly combined arms and involve substantial employment of the third dimension. The Indian Army, as a dynamic institution, has adapted well to the emerging security environment, but military transformation in times to come will have to be rapid, and driven by several factors—most importantly the doctrinal and technological drivers. The transformation in doctrines and capabilities would call for significant changes in organizational ethos, and melding of individual and organizational capacities.

Restructuring would involve shifts in military thought, structures, resource utilization and training to remain relevant.

Since future conflicts would primarily aim at gaining political advantage and not necessarily a decisive victory on the battlefield, the traditional doctrinal thought of capturing territories, destruction of the adversary's forces and strategic assets would require reconsideration. Limited wars and low-intensity conflicts would be the favoured mode of engagement, and the nuclear environment would influence future military conflicts and confrontations.

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