

JOINT CAPABILITY REQUIREMENTS OF INDIA'S ARMED FORCES: 2008-2033

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*Victory smiles upon those who anticipate the changes
that occur in the character of war, and not on those
who adapt themselves after the changes have occurred.*

—Gulio Douhet

Even as one respects Gulio Douhet's sagacious words, clearly the initiatives in strategic transformation for realising joint military capabilities envisaged over decades-long timescales tend to self-limit the 'transformational' nature of a complex process. In fact, a messianic overemphasis on radical transmutation may be tantamount to what Karl Popper, in another context termed "utopian engineering."¹ Perhaps a piecemeal engineering of step-by-step change or incremental transition, anchored in the reality that India's military is engaged, by mandate, in territorial/home defence, and will likely be involved in this primary mission for many years ahead, even as internal security and out-of-country contingency operations constitute role-additionalities, may suit the armed forces better.

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1. Stephen Ryan, *The Transformation of Violent Intercommunal Conflict* (Burlington: Ashgate Publishing Company 2007), pp. 26-27.

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the variable of resource-cum-funding support. Evidently, single Service capability optimisation constitutes the first step towards evolving a synergistic development and employment model for both home defence and out-of-country contingencies. Developing military capacity, thereafter, in common joint spaces, assumes yet greater complexity as it raises the need for a joint vision, a joint military net

assessment, a joint doctrine and joint operational procedures. Comparing the results envisaged with actualities on land, at sea and in the air, and, thus, avoiding unintended consequences, may perhaps be the judicious way to proceed.

This paper seeks to outline the joint capability required by the Indian armed forces for territorial defence in the light of the conflict spectrum and trends in contemporary warfare in a nuclearised environment. The responsibilities India would have to shoulder in the regional strategic environment and the challenges it would confront as it develops and sustains comprehensive national power during the quarter century 2008-33 (five Plan periods) would be a related dimension. Interestingly and significantly, the concluding point of the timeline coincides with the completion of the centennial of the Indian Air Force (IAF).

GLOBAL/REGIONAL STRATEGIC ENVIRONMENT

The world is in a state of dynamic equilibrium and would perhaps remain so for a couple of decades. Conflict, competition and cooperation coexist, as do deterrence and interdependence. The *portmanteau* "co-opetition" coined by Allen Brandenburger (Yale) and Barry Neilbuff (Harvard) in their 1999 book of the same title describes pithily a world order in which the security and foreign policies of nations would be configured on purely national interest-driven, issue-based and function-specific imperatives.

An existential polycentric global order that currently is imbued with a distinct unipolar-centricity is expected to prevail over the next 25 years. By that time, the centre of gravity of world strategic balance would have shifted unalterably to

Asia, not unlike the mid-18th century, when India and China accounted for nearly half the world's gross domestic product (GDP). Trends in multilateralism, the strengthening of its institutions, including a restructured United Nations (UN), with India as a member of the reconstituted Security Council, would provide India many challenges and opportunities.

Multilateral politico-economic and security-related groupings viz ASEAN Regional Forum (ARF), Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), India, Brazil, South Africa (IBSA), etc serve to provide a security balance which India could gainfully leverage. Non-governmental organisations, the media and the international community would increasingly acquire far greater clout on issues of conflict and peace. India's unique geo-strategic location, expected GDP growth rates of 9 to 10 per cent and increasing global acceptability and legitimacy constitute a unique advantage that would likely sustain for years. Being widely perceived as a prospective stabilising influence in Asia, India's strategy of national interest-driven multi-alignment with all the great powers and major global players – friendship with all, alignment with none – to balance any single-dominant power designs is unquestionably sound.

It is India's immediate neighbourhood that would continue to be a cause for concern due to its 'instability' and proclivity to bouts of volatility, a situation that is unlikely to change over the next quarter century. As to China and Pakistan specifically, despite the positive upturn in bilateral relations with both, India should be prepared to confront security challenges from both these traditional rivals. It is to be hoped that the predominantly democratic coalition government of the People's Party of Pakistan and Pakistan Muslim League (Nawaz Sharif) to get formed in Pakistan after the February 2008 elections would sustain the India-Pakistan peace process that has endured over four years. Yet, taking into account trends and pointers for less than best case scenarios, the China-Pakistan nexus could assume a collusive form, along specific strategic

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trajectories, and the Indian armed forces may have to bear the brunt of such a joint threat. In the light of the transformation in the nature of inter-state war during the early decades of the 21st century, only a strong aerospace power could help ease such an unbearable pressure, short of abandoning the no first use nuclear policy. We have seen how China's nuclear-missile assistance to Pakistan transformed India's strategic and security dynamic forever, and imposed severe constraints on conventional force employment. This would compel a careful analysis of future force design, especially for the land forces.

MILITARY CAPACITY BUILDING

During the next quarter century and beyond, China would constitute a potent challenge to India that could assume a military dimension, and, hence, the requirement for a countervailing capacity building. Nagging uncertainty persists on what course future Chinese leaders would set for their country, with its vastly expanded comprehensive national power, and how its rapidly modernising military power might be employed. Analysis of China's military acquisitions—notably in aerospace power and maritime forces—its strategic thinking (local wars under informationalisation), ability to field “disruptive military technologies... and generation of capabilities for conflicts over resources or territory”² has crucial significance for the nature of countervailing military capabilities India requires to build. It is significant that the bulk of China's military investments are in offensive trans-border strategic priority areas, including high-technology multi-role Su-30 class of combat aircraft, nuclear submarines, special forces, strategic airlift and cyber warfare. Sharp build-up of space capabilities and a wide range of ballistic missiles are its big ticket priorities. The recently announced defence budgets of India and China for 2008-09 at \$26 billion and \$57 billion are revealing: India's decade-long average annual budgetary increase at 10 per cent is nearly half of China's at 18 per cent.

Translated into percentage of GDP, India's defence budget has reached a 46-year low of below 2 per cent, while China, given the opacity of its actual defence

2. Department of Defence, USA, Annual Report to the Congress Military Power of the People's Republic of China, 2007, p.1.

budget, is widely believed to be spending far more than the officially-claimed 1.5 per cent. The Pentagon has assessed China's 2008-09 defence budget being between \$97 billion and \$139 billion, as against the officially announced \$57 billion. Such a huge allocation, and effective and expeditious translatability into tangible assets, makes China's military capability build-up formidable.

As to Pakistan, given the track record of the four-year-long bilateral peace process, the prospects of attenuation in the threat from that country to India cannot be ruled out, but wild cards cannot be factored out either. Pakistan's Indus river/Margalla Pass north-south near-fatal fault line straddling a medievalism-obsessed de facto 'Talibanistan' to the West, and a relatively moderate, progressive and accommodative Islamic dispensation to the east, has major security implications for India, notably with regard to Jammu and Kashmir. The end point could well be a scenario of increased (catastrophic) *jihadi* strikes in India. Given the experience of Operation Parakaram (2002), what would the political leadership's response be in such situations? It needs to be also highlighted that while all the indices of cross-border terrorism have shown a distinct downward trend over the last five years, starting 2002, there is no evidence to indicate that the terrorist infrastructure in Pakistan or Pakistan Occupied Kashmir has been wound down. The 'tap' can be opened whenever the establishment in Pakistan decides to do so.

There is a need to underscore that socio-economic growth and development; political stability and national cohesiveness; technological absorption and capacity building; and safeguarding national interest and managing conflicts would be the primary drivers for India's national grand strategy over the next quarter century. Such wide-ranging imperatives would necessitate an enabling environment of peace, stability and tranquillity—internal and external—for which conventional and nuclear deterrence against inimical external powers would be a prerequisite. Our 12th Plan (2007-12) objective of 9 per cent GDP growth, to be stepped up to 10 per cent during the early years of the 13th Plan (2012-17) and thereafter, would require capital and, crucially, energy accessed externally. The economic impact of rising powers is impelling a change in international relations and security policy due to the energy dynamic. China's foreign and security policies are increasingly

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driven by energy-related investments, particularly in Central Asia and Africa. As the International Energy Agency's World Energy Outlook of November 7, 2007 reveals³, by 2030 India would have to meet 90 per cent of its oil demands through imports. China may have to do likewise, thus, creating competition between them for secure energy supplies from sources in West Asia, Central Asia, the Caspian, Myanmar and possibly Africa and the South China Sea.

Peace operations, invariably under the UN umbrella, based essentially on multinational forces, in which India's forces have traditionally played a stellar role, and would continue to do so in the years ahead, is yet another dimension of international security with immense traction. In numerical terms, these are on the upswing—having increased from 48,000 troops deployed in November 2001 to 83,854 troops in February, 2008⁴. On the other hand the possibility of India employing a regional peace-keeping force as part of a 'coalition of the willing' with a general mandate of the international community rather than formally under the UN cannot be ruled out. This is because the UN's inability to intervene effectively in conflict-spots in recent years stands proven—a development that has encouraged the trend of conducting unilateral or coalition operations. Hopefully, the lessons of the ill-conceived, unprofessionally-planned and hurriedly-inducted peace-keeping force in Sri Lanka (1987)—without full institutional consultation with the three chiefs of staff of the armed forces—would not be lost on policy-makers planning for such contingencies in the future.

On the aspect of energy security and related imperatives, India's military capability planners and security policy-makers would require to delineate 'areas of vital interest' and 'areas of influence'. The former entail military capability to safeguard national security objectives, in expanding circles of vital interest, commensurate with military capabilities progressively built (Horn of Africa and

3. <http://www.climateactionprogramme.org>, p.3. Accessed on March 10, 2008.

4. <http://www.un.org/Depts/dpko/bnote.htm>. Department of Public Information, United Nations, February 2008. Accessed on March 8, 2008.

Straits of Hormuz to Malacca Straits and beyond, and Central Asia to the northern Indian Ocean), while the latter would remain the focus of innovative and robust diplomatic initiatives. Equity investments in 20 oilfields across 16 countries, from Vietnam to Venezuela and Sakhalin to Sudan, and their security, thus, come purely under the diplomatic genre. But a possible contingency where a small protection force may have to provide security to our assets against the threat of local non-state inimical groups could well arise. And India's capacity build-up would need to cater for such contingencies.

FORCE EMPLOYMENT

Evidently, an assessment of joint capabilities required by the Indian armed forces would be based on the foregoing evaluation of the strategic/regional environment, and on the five-point template of India's national security objectives for defence policy announced by the prime minister in the Lok Sabha in April 1994 and included in the Sixth Report of the Standing Committee on Defence presented to the Parliament on March 8, 1996. These comprise: one, defending national territory over land, sea and air (read from the threat posed by China and Pakistan); two, securing the internal environment against threats to unity; three, exercising (stabilising) influence over the immediate neighbourhood; four, contributing towards regional and international stability; and, five, possessing out-of-country contingency capability to prevent destabilisation of small nations in the neighbourhood.⁵ Subsequently, Pokhran II imposed the need for a joint capability 'triad' to sub-serve India's nuclear strategy. In a widened conflict spectrum—from sub-conventional conflict through limited borders war to conventional inter-state war all under the overhang of nuclear deterrence—force employment acquires immense complexities. Besides, peace-time protection of borders and the needs of internal security remain work in progress. What kind of joint military capabilities would future conflicts demand? Would these vary substantially from those today, and under upgradation, in any transformational sense? And what kind of force structures would require to be evaluated and defined? These are questions that warrant answers.

5. For detailed text, see Kapil Kak, "Direction of India's Higher Defence," *Strategic Analysis*, July 1998, p. 503.

For India, a war prevention oriented national strategy, restraint as a strategic tool, attempts at cooperative peace as against competitive security, and conventional and nuclear deterrence run in tandem. As nuclearisation has altered the conflict paradigm dramatically and imposed new challenges in escalation dynamics between limited conventional war and nuclear deterrence, the value of nuclear deterrence would, thus, be stronger when military capability is sustained at a sufficiently high level over the next quarter century and more. But if a conventional war/limited border conflict, possibly in the mountains, is thrust on us, the same would need to be concluded under the nuclear dynamic—whether from China or Pakistan—at least cost, in the requisite timescales, to attain a victory that politico-strategic objectives would so demand.

REQUIREMENT OF JOINT CAPABILITIES

Joint Vision: The Intangible

To evolve a deliverable joint long-term vision for development of joint military capabilities, in the required common spaces, over the next quarter century and beyond, the key imperative is joint thinking as also a joint approach to developing tri-Service synergies, wherever these are required. For this, it would be necessary to create best conditions and practices for cooperation between the three Services because the biggest impediment in achieving jointmanship is lack of trust, confidence and sensitivities. A consideration that is often disregarded is that the purpose of transforming military capacity is not only to effect change but anchor it productively in our own realities.

Without a participatory, transparent and genuine tri-Service ethos and environment, joint operations the world over tend to creak at the 'joints'! And India is no exception. Yet, jointmanship is a key battle-winning factor in any future war and conflict. It has been rightly said that the biggest impediment in inter-organisational synergisation is the human mind and inability to understand the other person's point of view. It is for this reason that cognition has been perceived as an important training tool for a military leader to acquire far higher levels of maturity.

In the Indian context, partnership has to be based on completely equal footing

regardless of single-Service aspirations, manpower, size, budgets and geographical spread. Jointmanship tends to lose potency when a relatively smaller-size, technology-intensive, operationally-decisive but seemingly non-dominant Service is sought to be 'controlled' and not provided full play to achieve strategic effect. The belief that imposition of an Indian variant of the US Goldwater Nichols Act (1986) would serve as a silver bullet for the problems seemingly bedevilling jointmanship in India is clearly hyperbole. Likewise, for the much-bruited integration: what is the type of integration necessary, and in which specific context of force application—a bi-Service army-air land-air battle or navy-air maritime strike scenario or tri-Service amphibious operations? It has been said that there has not been an amphibious landing since World War II! Would it be a vertical or horizontal integration, and why? Should it not be more prudent to have information and decision integration?

An effective joint doctrine, a long-term joint military net assessment, interoperable command, control, communications, computers, intelligence, information (C4I2) frameworks, and joint intelligence and logistics support systems are indeed the need of the hour for the specific joint operations envisaged. But all these would merely follow adoption of a truly joint thinking, joint approach and, most crucially, joint planning at the strategic, operational and tactical levels of military operations, conducted primarily within the sub-continent. Looking back, it is significant that two crucial committees of the chiefs of staff (even today the highest military body to provide tri-Service military advice to the Cabinet), the Joint Intelligence Committee (JIC) and the Joint Planning Committee (JPC) performed this task admirably even as the chiefs were required to be always in attendance at meetings of the Defence Committee of the Cabinet (DCC). The DCC was abolished in 1963, in the wake of the India-China War 1962, to be replaced initially by the Emergency Committee of the Cabinet and subsequently the Cabinet Committee of Political Affairs, so as to anchor defence decision-making in a politico-strategic context at the highest level. But ironically, today, the defence-political interface continues to be the weakest link in the chain. It is true that, chiefs of staff, either wholly or selectively, are invariably invited to attend meetings of the Cabinet Committee on Security to

proffer advice on specific military issues under discussion. But what has not gathered adequate traction is the crucial need for reform at the political dimension of defence decision-making through integration of the three Services Headquarters with the Ministry of Defence. Reform merely on the military side, envisaged under the chiefs of defence staff concept, would be tantamount to putting the cart before the horse.

While the Integrated Defence Staff of the Chiefs of Staff Committee could continue with the task of long-term force development planning that requires government resource allocation, there is an urgent necessity to have in place a re-structured and revitalised JPC, with a permanent staff, for effective force employment planning, notably for joint operations. As to out-of-country contingencies, disappointingly, the joint doctrine of India's defence forces is reported to have made only a superficial mention of such imperatives and "stayed clear of articulating any definitive intervention philosophy and overseas stability operations."⁶ Given that every single element of national power must work in tandem for such contingencies, jointness must, perforce, go beyond the military. Diplomacy, sciences and technology, defence procurement agencies and other organisations must all be involved with such operations.

JOINT CRISIS RESPONSE: THE TANGIBLE DETERMINANTS

Locale and Contingencies

As indicated earlier, India's military responses to a regional crisis affecting its vital national interests could be unilateral or as part of a multinational coalition. Precise crisis-locales being unpredictable, various contingencies could be scripted-scenarios ranging from the 'smug' to the 'doomsday'! Afghanistan, Nepal, Sri Lanka, Bangladesh, Maldives, Mauritius, Seychelles could, however, feature in the calculus as would a possible compulsion to protect the 4.2 million Indians currently resident in West Asia. Evacuation of these nationals with concurrent humanitarian operations could be a possibility. It would be useful to recall that during the Gulf War (1991), 1,13,000 of the 3,00,000 Indian citizens

6. See Arjun Subrahmanyam, "Out of Country Contingencies: Peacekeeping, Enforcement and Stability Operations." Paper presented at the 4th Subroto Mukerjee Seminar on Indian Air Force in the Decades Ahead held in New Delhi, on November 17-18, 2007, p. 1.

resident in the region at that time were flown back home on aircraft of the Indian Air Force, Indian Airlines and Air India in what remains till today the second largest airlift in world history after Berlin. In meeting regional crises, warning time available, risk-levels, determination and leadership of adversary forces, 'decisive force', casualty-acceptability and weather would influence the ability to achieve military objectives. Lower order contingencies and developments that could threaten India's interests could also include local civil wars, insurgencies, border conflicts and dangers to Indian commercial interests.. Aerospace dominance platforms with related maritime dominance (where applicable), fused intelligence assessments and precision weapons, would be essential prerequisites for response.

Role Balance

Military capabilities for crisis response evidently serve to generate options for the political leadership to employ force to safeguard vital national interests. But given the compulsions of credibility and affordability, there is need to factor into the planning calculus what capabilities would meet the imperatives of a conventional (limited) war, the need to respond to crises and those that form part of shaping the strategic neighbourhood. The criticality of our national interests in relation to the character and quantum of out-of-country force deployed would, however, be the key determinant. We could create a peace-keeping force having tri-Service assets by way of firepower, mobility, sustainability and self-sufficiency for a deployment timeline extending to about a month.

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Forward Presence

In the near term, given India's existential power, influence and military potential, this appears problematic. But over the long horizon, this aspect, including forward based airfields in friendly countries, could provide such

nations reassurance and lend credibility to friendships, help deter threats, impart invaluable knowledge of regional conditions and assist in crisis response. Rotational and periodic developments, joint exercises, military to military contacts, reassuring the Indian diaspora, and jointly combating international terrorism and narcotics-trafficking are likely to remain central to our regionally oriented crisis response policy. The broad nature of such contingencies, and the regions and countries of India's vital interests where India's military capability may need to be applied would have to be included as part of a joint military net assessment having both classified and unclassified segments, with the latter being made available to think-tanks in the public domain. Needless to emphasise, situations, force applications and their play-out require war-gaming to impart realism.

Command and Control

A suitable command and control structure for a major out-of-country military presence would need to be in place commensurate with the nature and character of the task required to be undertaken. This could take the form of an ad hoc joint command structure on the lines adopted for Sri Lanka (1987-89) that is believed to have worked well. Also, the out-of-country contingency forces commander could be placed either directly under the chairman, Chiefs of Staff Committee or alternatively, as some have suggested, under one of the existing regional single Service commands. The former option, however, would be more appropriate. These are issues that could well be resolved at the Chiefs of Staff Committee level. The key issue here is that political, diplomatic, military energies would need to be synergised at the highest politico-military levels. For all other in-country territorial defence joint operations, the existing command structures with inter-command coordinatory operational linkages, suitably finessed, may not need to be disturbed.

Disaster Relief

Following the passage of the National Disaster Management Act (2005) and establishment of the National Disaster Management Authority, the capability of

crisis response, both nationally and regionally, requires to be synergised still more for disaster prevention and mitigation. Requirement of capacity building in early warning, communications, mobilisation of land, maritime and air resources, including air-based reconnaissance and relief, and rapid and comprehensive response would merit optimisation in the years ahead. The highly acclaimed tsunami relief operations (2004) could serve as the basis for multinational response planning and execution operations.

INTERNAL SECURITY

Internal turbulence is a manifestation of socio-economic inequity, poor governance and rule of law enforcement, and people's perceived socio-political grievances of an aspiration-delivery mismatch, increasingly but often inadvertently fuelled by the power of the media. This security challenge is expected to prevail for decades. The answer lies in the political domain, with military capabilities brought to bear only when the insurgency is supported and tangibly inflamed by inimical neighbours.

Although land force-centric in character, counter-insurgency/militancy operations have often involved employment of air power reconnaissance, surveillance and transportation assets and, of late, unmanned aerial vehicles (UAVs). Traditional political reservations on employment of manned airborne combat platforms preclude their use. But, in the future, this could alter, as micro-precision weaponised UAV/manned airborne platforms have the potential to be effectively employed in this role, especially in urban warfare scenarios, when the targets are unambiguously confirmed as foreign terrorists.

RESOURCE DEVELOPMENT

Requirements of joint military capacities encompass an array of specific resources that call for development in the timeline of 2008-33. These are briefly flagged below:

- **Funding and R&D.** Funding is the prime driver for capacity-building and would, thus, need to not only sustain the ongoing single Service modernisation but also fulfill other upgradation plans. Defence expenditure

as a proportion of GDP would certainly require to be stepped up to about 3 per cent from 2.27 per cent (2005-06). This would also make available resources for defence research and development (R&D), energise the defence industry, notably the high technology aerospace sector, and obviate any unacceptable strategic or conventional asymmetry in relation to China.

- **Forces' Needs.** As stated earlier, in a nuclearised environment, there would be major constraints on employment of land forces. Focussed shallow thrusts across a wide frontage, backed by heavy firepower, to capture slices of enemy territory as a bargaining leverage could perhaps be the only workable options. Force structure emphasis requires to shift from the plains to the mountains with the focus being on trans-Himalayan capabilities. Raising of additional specialised offensive mountain divisions with the capacity of dispersed operations, supported by air mobility assets and having sufficient fire support provided by ultra-light howitzers would greatly widen the choice of offensive options. On the other hand, special forces would have a key role in exploiting the adversary's vulnerabilities. All three Services would have to build effects based capabilities. The ability of aerospace power to deter, both by denial as also punishment, employ force in coercive and compellence roles, strike at strategic, operational and tactical levels of conflict simultaneously, pursue air dominance, and achieve strategic effect makes it a politically acceptable force employment option in a nuclearised environment. Besides, its other unique characteristics of trans-oceanic strategic penetration and reach, precision force application and persistence, all at the speed of sound would require to be effectively leveraged. More critically, until a full-fledged 'triad' is in place in about two decades, dual capable manned combat aircraft would be the only retaliatory option in a nuclear deterrence breakdown. The numerical downslide in combat platforms, from a quarter-century norm of 39.5 squadrons to about 30 today, must not only be rapidly arrested but also built further to a 55 combat squadron air force over the next quarter century. This is because of the truism that force multipliers cannot serve as a substitute for 'force. Besides, security-externalities would increasingly shift India's focus in terms of applying its aerospace power towards trans-national issues that today constitute priority

challenges—international terrorism, assistance to friendly countries or disaster management. Thus, projection of defence capability, geared to joint hard-soft power options that advance India's national interests, could become a normative compulsion. Naval forces would require credible oceanic presence to counter adversary efforts to carve out spheres of influence. These must also protect own sea lanes of communications (SLOCs). Amphibious capabilities may, by 2033, require beefing up to division strength.

- **Space Systems.** Military space activities that India would need to build up over the next quarter century are: space support (access, satellite control, space launch and on-orbit support); force enhancement (C4I2, navigation and targeting, meteorology and tactical warning and attack assessment); space control (anti-satellite—ASAT— and space tracking); and force application (ballistic missile defences). The statement of Air Chief Marshal F.H. Major, India's chief of the air staff on the sidelines of the Singapore Air Show 2008 that the IAF was conceptualising and developing plans for a satellite-based eyes in the sky project designed to improve India's strategic reach and capabilities needs to be seen in this light. India would, moreover, require a capability for rapid launch of satellites to replace those destroyed or disabled during conflict. Short of space -weaponisation, ASAT capabilities in-being for both 'hard kill' and 'soft kill' would be necessary. We would need to take a cue from China which has exhibited great clarity with regard to the goals and future of its space programmes.
- **Technologies and Personnel.** Technological expertise and industrial capacities comprise the bedrock of a strong nation. So, the infrastructure that would support India's ability to develop joint military capabilities over the next quarter century would include technological strength, high technology industrial base and skilled personnel, whose technical abilities require many years of training and expertise. In fact, the private industry, services sector and the academic world would compete for the same pool of scientific and technological expertise. High end technologies would also have to be planned for and developed indigenously.⁷

7. P.S. Suryanarayana, "India and a new US Game in East Asia," *The Hindu*, March 6, 2008, p.11.

- **Special Interest Capabilities.** A synergised multi-sensor high band-width information technology (IT) network is a crucial need for satellite and manned aircraft surveillance and reconnaissance. Besides, there exists an imperative to obtain timely warning of changes in the capabilities of potential adversaries. Robust, interoperable, mobile and flexible C4I2 systems are also needed for strategic forces, network-centric operations as also in joint force employment scenarios. Besides advanced electronic warfare (EW) systems, directed energy and micro-waves weapons, and nano technologies are areas that would find increasing military application in the decades ahead and need to be developed.
- **Mobility.** Rapid response has always been a critical need and its requirements would only grow. Special forces could be considered for interventions more suited to their unique capabilities. Future mobility requirements would have to be based on a synergised armed forces' mobility strategy. Inter-relational factors, including warning times, potential challenges, risks involved and lift force needs, for both territorial defence and crisis response contingencies, would need to be factored into such a mobility plan. Additional sealift requirements and surge capacities and improvements in strategic airlift, which have cried for attention over many years, and medium transport to support induction, sustenance and de-induction of a peace/stability force, would need to be planned on priority. Rotary wing platforms for air transportation and resupply in future conflicts, notably in the mountains, would also require consideration.