

# AIR POWER

*Journal of Air Power and Space Studies*

Vol. 13 No. 1 • Spring 2018  
(January-March)



## Contributors

Shri N N Vohra • Dr Shalini Chawla

- Group Captain R K Narang • Air Vice Marshal Manmohan Bahadur
- Group Captain T H Anand Rao • Mr E Dilipraj
- Mr Ramnath Reghunadhan • Air Vice Marshal Rajesh Isser

# CONTENTS

Editor's Note	v
1. <b>NATIONAL SECURITY MANAGEMENT: SOME CONCERNS</b> <i>N N Vohra</i>	1
2. <b>INDIA'S PRIORITIES AND CONCERNS IN AFGHANISTAN</b> <i>Shalini Chawla</i>	17
3. <b>PLA REFORMS: POLITICAL AND STRATEGIC IMPLICATIONS</b> <i>R K Narang</i>	39
4. <b>AIR POWER IN HYBRID WAR</b> <i>Manmohan Bahadur</i>	59
5. <b>THE QUEST FOR SPACE CONTROL</b> <i>T H Anand Rao</i>	81
6. <b>ORGANISATIONAL GOVERNANCE OF CYBER SPACE IN INDIA</b> <i>E Dilipraj and Ramnath Reghunadhan</i>	115
7. <b>OPERATION RAHAT: A TASK FORCE COMMANDER'S ACCOUNT</b> <i>Rajesh Isser</i>	135

## EDITOR'S NOTE

Two issues have occupied centre-stage in the New Year. The first must be the vitriolic exchange of words and threats between President Kim Jong-un of North Korea and President Trump of the USA. The world witnessed rising tensions in the nuclear arena and was rightly chary about some miscalculation that could plunge it into a near unrecoverable catastrophe. The apprehensions were increased with the release of President Trump's Nuclear Posture Review. In the prevailing environment, the Review became the subject of considerable discussion and commentaries. The upshot was that with a departure from the Obama doctrine, the Trump doctrine spoke of the usability of nuclear weapons. His plan to develop low yield weapons to be used as warning shots and even placing such weapons on nuclear submarines was rightly construed as unnecessary brinksmanship. At the same time, the Review also espoused a strong deterrent approach to the Russian 'escalate to deescalate' philosophy. It is obvious that the deterrent would apply to other countries as well, including North Korea. The contradiction in the two approaches was not lost on anybody. Yet the danger of what two mercurial presidents may do, or cause to happen, represents an ever present danger. Common sense would suggest that no one is likely to use nuclear weapons but then why are the two presidents brandishing swords? Many heaved a sigh of relief when the two presidents agreed to meet in May this year. It is difficult to predict what would be the result of the meeting if, indeed, it does take place, but this *Journal* will keep our readers abreast of the happenings and their import.

The second notable event was the decision taken in China that the tenures of the president and vice president would not necessarily be limited to two

terms or ten years. This was on expected lines and the Chinese strongman Xi Jinping could now remain president for life. Even though it was foreseen by many, the passing of the resolution caused ripples worldwide and in China as well. Has President Xi Jinping been made, or allowed to become, a dictator for life? It is still early to conjecture about the possible repercussions, particularly within China. Will a 'dictator' be allowed unfettered powers in a country rapidly becoming a global power and its people now enjoying prosperity not known for many years? Many questions arise, not the least of them being the president's ability to exercise control over the social media and over the disgruntled elements in the political hierarchy and in the People's Liberation Army (PLA). Once again, this *Journal* will reflect on these aspects in our future issues.

Shri RN Kao is a much respected man amongst the 'intelligence' fraternity. We carry the R N Kao Memorial Lecture delivered on January 21, 2018, by the Governor of Jammu and Kashmir, **Shri N N Vohra**, as our lead article. The theme of the talk was national security management and Shri Vohra is a noted expert on these issues as well. The article makes very good reading.

The Afghanistan-Pakistan imbroglio and the happenings in China remain of abiding interest. In a well-researched paper, **Dr Shalini Chawla** discusses India's policies and concerns in Afghanistan and **Group Captain Narang** examines the strategic and political implications of the recent PLA reforms.

Warfare has its myriad manifestations and it has been so since times immemorial. Recently, the term 'hybrid warfare' has gained considerable currency. The spectrum of conflict is now vast and all nations naturally use their strengths to advantage. The military machine is not necessarily fighting the war by itself, and can, and should, get support from wherever it can. **Air Vice Marshal Bahadur** explains the concept in some detail and analyses the role of air power in this type of warfare.

Space and cyber are now the fourth and fifth domains of warfare and their relevance is increasing. **Group Captain Rao** looks at the growing importance and relevance of space assets and the need to ensure that the capabilities linked to space assets are not denied to us. The importance of space control can be envisaged at present but will be keenly felt in the not too distant

future. As for the cyber domain, while there is appreciation of the role that the threat of cyber attacks can play in both war and peace, possibly, more work is required on how the domain can be utilised to advantage, and cyber crime, in its various manifestations, controlled. In this respect, **E Dilipraj** and **Ramnath Reghunadhan** explore the issue of cyber space governance in India.

In recent years, there have been numerous occasions when the Indian Air Force (IAF) has been called upon to provide succour during environmental and other disasters. **Air Vice Marshal Isser** has considerable experience in the IAF's contribution towards Humanitarian Assistance and Disaster Relief (HADR). His first-hand account as a commander of the task force in one such instance is our last article in this issue. It makes compelling reading and should be a guide for all those who may be called upon to plan, or conduct, such operations.

Happy reading.



# NATIONAL SECURITY MANAGEMENT: SOME CONCERNS

N N VOHRA

I feel privileged to have been invited to deliver today's lecture to remember Rameshwar Nath Kao and his outstanding contribution in the arena of intelligence, particularly his role in establishing the external intelligence agency and placing its functioning on a sound footing.

The first time I had the opportunity of meeting this elegant personality was when, immediately after the Sino-Indian conflict, I was inducted into the Special Services Bureau. Kao Sahib counselled me and another officer before we underwent training with the Special Air Service (SAS) of the UK. Over two decades later, in early June 1984, I was summoned to meet him late one evening at Chandigarh. At that time, he was the security advisor to the prime minister and had arrived from Delhi to assess the post Operation Blue Star situation in Punjab and advise Mrs Gandhi about the possible next steps. The duration of my meeting with Kao Sahib got considerably extended as he questioned me at great length about the genesis of the developments in Punjab which had led to the army having to enter the Golden Temple. Whatever may have been the content of Kao Sahib's report to the prime minister, within three days of his visit to Chandigarh, orders were issued for the immediate replacement of the governor and the removal of his advisors, along with the chief secretary and director general of police.

---

Shri N N Vohra, presently Governor, Jammu and Kashmir (J&K), has formerly been Defence Production Secretary, Defence Secretary, Home Secretary and Principal Secretary to the Prime Minister.

And I received midnight orders to replace the home secretary of the state.

In the subsequent years, till Kao Sahib's passing away, I had the opportunity of meeting him on a few occasions. A low profile intellectual, he remained perennially preoccupied with his professional concerns. When not engaged in work, he was an extremely engaging personality. Among his many attributes, he spoke excellent Urdu and recited profound couplets.

As the founding father of the Research and Analysis Wing (R&AW), Kao Sahib retained this position for many years, till he retired from service. Post superannuation, he served as security advisor to the prime minister and in several other capacities. I pay tribute to this doyen of the Indian intelligence system.

On account of varied unforeseen circumstances, both during service and after retirement, I have been involved in the security management arena for over three decades, in one capacity or another. This evening, I shall speak about some of my concerns regarding the manner in which our security management system has been functioning and what perhaps needs being done to meet the growing serious threats from varied quarters.

In any discussion about issues relating to security management, it would do well to keep in mind that India is a large country with about 1,200 islands, an Exclusive Economic Zone (EEZ) of several million sq km, and land and sea borders which span nearly 23,000 km. Besides this daunting spatial factor, we have a large and growing population of about 1.3 billion which comprises 4,635 multi-religious communities who speak 179 languages and 550 dialects. The vastly varying socio-cultural and religious traditions of our communities are embedded in thousands of years of their past histories.

Since independence, our country has achieved considerable progress on varied fronts but we still have significant illiteracy and unemployment and a nearly one-fifth of our people subsist below the poverty line. Needless to say, the governance of India poses enormous challenges, and safeguarding the country's security is truly a colossal task.

While discussing issues relating to the preservation of India's unity and territorial integrity, it would be useful to have a quick look-back at our

past experiences. Briefly, in the decades gone by, there were serious internal disturbances, as also incidents involving communal conflicts, which led to large scale human and economic losses in various parts of the country. It would not be feasible, within the course of this lecture, to go into the causes of the various disturbances. However, it would be relevant to note that the states have the constitutional responsibility for the maintenance of peace and public order, and are vested with powers to make all the required laws and to take all the necessary executive decisions for ensuring internal security within their jurisdictions. Insofar as the union is concerned, it has the much larger responsibility of protecting the states against war and external aggression and internal disturbances.

While our Constitution makes a reference to *security* and not to *national security*, it would be incorrect to arrive at the conclusion that the union and the states have distinct and separate duties for safeguarding the country, and providing safety and security to the people of India. It could, perhaps, be postulated that the lack of reference to *national security* in our Constitution, if such a specific mention was at all required, may be for no better reason than that the founding fathers of our Constitution were, at that juncture of our history, deeply concerned about the challenges of nation building and how the gigantic problems of resettling millions of refugees, large scale poverty, illiteracy, hunger, unemployment and widespread underdevelopment would need to be tackled. It was not envisioned that, within days of our gaining independence, India would have to face the Pakistan sponsored invasion of Kashmir.

Because of the time factor, it would not be possible to comment on how the union and the states fared in dealing with the major security challenges faced in the earlier decades. I shall, instead, briefly comment on the major problems which emerged in the past and state that these have largely been related to Pakistan's continuing proxy war in Jammu and Kashmir (J&K); *Jihadi* terrorism which has continued to grow in both reach and spread in various parts of the country; the continuing violent activities of the Left Wing Extremist (LWE) groups; and the still active insurgencies in the northeast region. I will comment briefly on each of these threats.

The Pakistani Inter-Services Intelligence (ISI) has been launching unceasing campaigns to spread radicalism and provide training, weapons, communication



systems, funds and varied logistical support to enable its terror groups to infiltrate into Jammu and Kashmir and spread violence and chaos. It has also been continuing its attempts to revive Sikh militancy in Punjab, besides, pressurising various Sikh militant groups to join hands with the Kashmir-centric terrorist outfits. Side by side, the Indian Mujahideen and other terrorist groups, based in Pakistan and several other neighbouring countries, have been continuing their endeavours to perpetuate terrorist violence in the country.

The armed struggle being carried out by the left wing extremist groups, which aim at securing political power, continues to pose serious security problems in several parts of the country. As regards the activities of the various insurgent groups which are still active in the northeast region, recent reports suggest that, consequent to certain initiatives taken by the Government of India to engage the warring groups in peace talks, there has been some decline in the number of incidents and the levels of violence.

It needs being noted that ever since the advent of terrorism in India, issues relating to the effective management of *national security* have emerged as perhaps the most crucial challenge faced by the union. It is now also well recognised that unless there is peace and normalcy in the land, it would not be possible to achieve meaningful growth and development for promoting the welfare of our people.

The 8/11 incident in Mumbai, and the resulting enormous human and economic losses, sounded a clear warning that India's existing security management apparatus is inadequate for countering terror attacks from across its land and sea frontiers or from across the skies.

Before suggesting steps which may be taken for more effectively safeguarding India, it would be useful to have a broad understanding of the term *national security*. In simple words, *national security* comprises all facets of *external security*, which relates to protecting the country's territories against war and external aggression, and *internal security* which includes all matters relating to the maintenance of peace and public order across the length and breadth of the country.

As I have stated on earlier occasions, the first generation of our security analysts had found it convenient to distinguish between internal and

external security, and to focus almost entirely on issues relating to external threats. In my view, such a sectoral approach is erroneous and untenable. Any scope for segregating the management of issues relating to internal and external security was obliterated when Pakistan launched its proxy war in Jammu and Kashmir. Furthermore, over the past nearly three decades, issues relating to the management of internal and external security have got deeply and inextricably intertwined. It would be relevant to also note that, over time, the sources of arising security threats have got geographically spread far beyond our immediate neighbourhood to countries in Southeast Asia, the Middle East and in the Western hemisphere.

In the context of what I have so far stated, it needs being recognised that our security concerns relate to innumerable targets and activities within our country and it would no longer do to merely focus on defending our frontiers.

I would go to the extent of saying that, today, there is no important institution or activity which is not insecure. It has, thus, become extremely essential to safeguard almost every arena and to particularly secure arrangements relating to food, water, energy, nuclear power, science and technology, environment, ecology, finance, business, commerce, banking, cyber space and other important fields.

As I had observed in the beginning of this talk, our country represents an immense cultural and geographical diversity and the unhindered interplay of cultural and religious identities in our large and unfettered democracy has the potential of generating disagreements and confrontations which could lead to large scale disturbances, especially when an external adversary agency also steps in. Thus, if the unity and territorial integrity of our country are to be preserved, it would be of vital importance to ensure security on all fronts and, besides, devote particular attention towards promoting tolerance and communal harmony among our people.

At this juncture, it would be useful to pause and ask ourselves the question: in view of the security challenges faced in the past seven decades, has our country been able to evolve a comprehensive national policy and the required infrastructure to safeguard the nation on all fronts? Based on my

personal experience in the past many years, my answer to this question is that so far we have neither secured the required union-state understandings nor developed a pan-India approach which would meet the requirements of a National Security Policy.

Insofar as the role of the states is concerned, the union has not so far been able to convince them to fully accept their constitutional duty to maintain internal security within their jurisdictions. In this context, it needs being stated that, in the years past, a majority of the states have been unable to establish efficient intelligence agencies and maintain well trained police forces in adequate strength to effectively put down any arising disturbance. Consequently, the states have been perennially relying on the union for the deployment of central armed police forces, and even the army, for the restoration of normalcy in the disturbed areas. Thus, in the past decades, particularly in the northeast region and Punjab, the union's armed forces have had to be deployed on an extensive scale and for prolonged periods. Among the consequences of such deployments, there have been recurring agitations against the alleged violations of human rights of the affected populations and vociferous demands for the repeal of the Armed Forces Special Powers Act.

Besides their failure to adequately discharge their constitutional responsibility to maintain internal security within their realms, the states have also been found wanting in providing unstinted support to the union's endeavours to safeguard national security. Among other matters, the states have been questioning the union's authority to take any preventive or preemptive action to deal with an emerging internal disturbance on the plea that maintenance of law and order is the constitutional prerogative of the states. Notwithstanding the constitutional position, as per the practice which has got established over the past decades, the union has refrained from *suo motu* deploying central armed police forces in any state to preempt an arising disturbance or even to protect the Government of India's own properties located in various parts of the country. As per its continuing approach, the union has been deploying its armed forces only after consultation with the affected state or at the latter's request.

It is not easy to explain the Government of India's approach, particularly in the context of the constitutional prescription that *it shall be the union's duty to protect the states against internal disturbances*. Considering the developments which led to the demolition of the Babri Masjid, questions have been repeatedly raised about what exactly is the union's constitutional responsibility, particularly when it is duly warned, and is well aware, of an arising conflagration, as was the case before the demolition of the Babri Masjid. Furthermore, after the 8/11 terror attack in Mumbai, grave concerns have also been voiced about the union's actual capability for dealing with such challenges.

Because of the constraint of time, I shall not comment on several other issues which relate to the present discussion but reiterate my essential concern that there must not be any further delay in promulgating a well considered National Security Policy which is founded in unambiguous union-states understandings to work together for collectively safeguarding the country's unity and territorial integrity.

It is a matter of serious concern that the states have not been able to provide adequate budgetary resources for maintaining their police forces in sufficient strength. The states are also reprehensible for interfering in the day-to-day working of the police organisations and politicising their functioning, which has resulted in eroding the discipline, integrity, morale and professionalism of the constabularies. It is regrettable that, to explain their varied failures, the states have been advancing the specious argument that they suffer from paucity of resources and, that, in any case, it is the responsibility of the union to provide them adequate funds for the expansion and modernisation of their police forces as under the Constitution, *it is duty of the union to protect the states against internal disturbances*.

If the states have to become self-reliant in effectively managing internal security, they shall necessarily have to take urgent steps to carry out the now very long pending police reforms, which have been recommended by several national committees and commissions, and even by the Supreme Court of India.

It is shameful, indeed, that even seven decades after independence, many state police organisations are still functioning under a Police Act which was

enacted by our imperial masters nearly 160 years ago. And most states have still not meaningfully carried out the Supreme Court's directions for fundamental reforms being implemented regarding the functioning of the constabularies. Besides defaulting to enact the Model Police Act, which was drawn up under the directions of the apex court, the states have also failed to set up Police Complaints Authorities and State Security Commissions to segregate law and order from investigation functions and to set up separate intelligence and anti-terrorist units.

All over the country, the police is the first response force and it is of crucial importance that the constabularies in all the states are highly trained and motivated, and all their service and family conditions are looked after satisfactorily. Considering the past track records of the states in regard to security management, the union shall need to draw up a state-wise action plan for bridging all the existing gaps and shortfalls and, towards this end, the states shall also need to be financially assisted.

Over the years, whatever may have been the complexion of the political parties in power, it has been the union's general tendency to avoid any confrontation with the states, far less question them about the factors and influences which have been leading to recurring internal disturbances. Consequently, whenever approached by a state in distress, the union has been, without fail, providing assistance by deploying the central armed police forces, and even the army, to restore normalcy in the disturbed area. Thus, the union has concerned itself essentially with dousing fires and has rarely ever questioned the states about the root causes of the disturbances in their areas.

The union has also been hesitant in exercising its authority under Article 256 of the Constitution to issue appropriate directives to the affected states for taking the required actions to timely quell arising disturbances. On the contrary, the practice actually followed in the past decades has been for the Union Ministry of Home Affairs to merely issue "advisories" to the concerned states in regard to the management of emerging situations. Thanks to the Home Ministry's amiable approach of only issuing cautionary notes to the concerned states, it has not been possible to preempt any arising disorder.

If we recognise the gravity of the progressively enhancing security threats which are emerging from varied sources, from our neighbourhood and beyond, and also remember that it is the duty of the union to protect every state against internal disturbances, then no more time can be lost in the union taking immediate initiatives for finalising a holistic National Security Policy and, thereafter, proceeding to establish the required nationwide machinery for implementing it.

For securing the required union-state understandings in the arena of national security management, it would be enormously beneficial if the draft National Security Policy and all major issues relating to its implementation are discussed and settled in meetings with the chief ministers under the aegis of the Inter-State Council (ISC), which is chaired by the prime minister.

Once the states have clearly accepted their responsibility to maintain internal security, there would be no reason why they should not become progressively capable of effectively dealing on their own with any arising internal disturbance. And when the states become self-reliant, the union shall be able to progressively reduce the large scale deployment of its armed forces for dealing with disturbances in the states.

In the foregoing context, it needs being noted that except in Jammu and Kashmir, where we are fighting Pakistan's proxy war, the recurring deployments of the army elsewhere in the country, for dealing with local insurgencies and internal disturbances in the states, have the rather worrying potential of blunting the army's edge, besides generating internal problems regarding the operational efficiencies of its officers and men who are recruited, trained and equipped to fight and destroy the enemy at first sight and not be involved in situations in which the rules of engagement demand considerable restraint

Once the union has been able to promulgate a bi-partisan National Security Policy, the next important step would be to undertake a thorough state and union territory-wise critical review to identify deficiencies in the existing security administration systems. Side by side, it shall be useful to carry out a close critical assessment of the union's own wherewithal for discharging its constitutional responsibility to safeguard the nation.

The union would need to review its obligations on various fronts and, *inter alia*, enhance allocations to enable the central intelligence agencies to significantly enlarge their capacities for providing timely intelligence to various quarters, at the Centre and in the states. And among their many responsibilities, the intelligence agencies shall need to urgently equip themselves for particularly protecting the defence and governmental establishments, the financial sector, and large public and private organisations against cyber crimes.

It would be beneficial if the chiefs of both the internal and external intelligence agencies take timely initiatives to critically review their existing charters and revisit the oversight mechanisms, such as may be in existence, for reviewing both their policies and operations. These steps should be taken proactively, without waiting for pressures building up to question the obtaining policies, procedures and systems of the intelligence apparatus. While undertaking such an exercise, it should be kept in mind that the two central intelligence agencies in India do not report to the same minister. Also, unlike in the years gone by, it may not be a sound basis to assume that oversight by the concerned Cabinet ministers is adequate in as much as they are accountable to the Parliament and that such an arrangement is good enough. In this context, it may be recalled that the Kargil Review Committee had noted the absence of coordination, governmental correctives and the need for checks and balances. Among the various models followed in the advanced countries, I find that the UK's Intelligence Services Act (1994) provides for a Parliamentary Intelligence and Security Committee which examines the expenditure, administration, and policies of the intelligence services. With such modifications as may be required, this statute appears to be more in tune with our administrative ethos and deserves early examination.

If internal security is to be effectively maintained and we are to move towards assured national security management, it would be urgently essential to implement reforms and improvements in the entire framework of the criminal justice system. Unless this system functions with speed, efficiency and visible fairness, it would not be possible to reduce criminality and establish a healthy respect for the law. As the very first step, the criminal

courts shall need to achieve a significantly improved disposal rate and also stem the decline in the conviction rates, which is due to the prolonged delays in investigations and trials. As per reports, year after year, several crore criminal cases continue to await trial and an equal number remain pending for want of investigations. Such a situation must not be allowed to continue and the union must take all the required steps to introduce improvements on a time-bound basis.

Besides the enormous logistical inadequacies which adversely affect the proper functioning of the courts, there is also a subsisting question mark about the integrity of the subordinate judicial services. Unfortunately, in the past years, allegations have been raised even against those who man the higher judiciary, including up to the august level of the chief justice of India. Indisputably, urgent and effective steps shall be needed to clean up the system to enforce judicial standards and deliver speedy, clean and effective justice.

Another area of serious concern is that while we have a plethora of obsolete and outdated laws in the country, we have still to enact comprehensive laws, with pan-India jurisdictions, to deal with terrorism, cyber crimes and economic offences and to tackle the growing criminality which is perpetrated by organised crime, drug trafficking and mafia groups, many of which have close connectivities with terrorist organisations.

Needless to stress, when union-states understandings are arrived at in regard to the management of national security, a very important agreement shall have to especially provide for the enactment of an anti-terror law, enforceable in the entire country, which enables the concerned union agency to take immediate cognisance and launch investigations, without having to obtain sanctions and clearances from varied state or central authorities.

As of now we have only the National Intelligence Agency (NIA) which was enacted in a rush after the 8/11 terror attack. This statute requires considerable strengthening to ensure immediate cognisance of offences committed anywhere in the country, to be followed by prompt investigations. Also, the list of offences covered by this law needs to be dynamically reviewed and enlarged and, side by side, attention given to upgrade and enhance the powers and modalities for special investigations. Further, the obtaining



procedures for the establishment of special courts and the completion of trials within given timeframes also need to be urgently reviewed and rationalised. If the NIA is to function as the nodal agency to counter terrorism, cyber crimes and other major threats, it shall need to be provided very strong and prompt support by the central and state intelligence agencies and by the law enforcement machinery all over the country.

Many years have elapsed since it was proposed to establish the National Counter-Terrorism Centre (NCTC). If I recall correctly, this proposal was opposed by the states which had demanded that the law to establish the NCTC should be passed by the Parliament and, further, that this organisation should be administered by the Union Home Ministry and not by the Intelligence Bureau. These arguments reflect the distrust of the states in the functioning of the security organisations managed by the union and yet again point to the urgent need for arriving at the required union-states understandings to lay the bedrock of an effective National Security Policy.

As is well known, varied threats to national security also originate from corruption in the administrative systems, all over India. As past experience has shown, corruption vitiates the Constitution and the rule of law and destroys the very foundations of the administrative and legal systems. It generates unaccountability and inefficiencies which, in turn, cause anger and helplessness among the people at large, particularly the poor and marginalised segments who may be even further alienated, and compelled to resort to arms.

It is also known that corrupt elements in the governmental establishments may have connectivities with criminal and anti-national elements and, thus, have the potential of sabotaging and subverting the national interests from within, while working in establishments in which they have got themselves entrenched. It would be stating the obvious to stress that the union and the states need to urgently join hands to identify and weed out all corrupt elements in the entire administrative machinery, particularly from the civil, police and judicial systems.

As regards the subversion of national security interests from within the governmental systems, it may be recalled that consequent to the Mumbai serial

blasts in March 1993, the Government of India had set up an inter-ministerial committee, chaired by the union home secretary, to *inter alia* ascertain how the Dawood Ibrahim criminal gang had succeeded in bringing several tonnes of RDX into Mumbai city to carry out the serial bombings. This committee, generally referred to as the Criminal Nexus Committee, had arrived at the conclusion that criminal activities can be carried out virtually unfettered, because of the existence, in several parts of India, of an unwholesome nexus among corrupt politicians, dishonest public servants and organised crime and mafia gangs. Twenty-five years have since elapsed. It is apprehended that such networks may have since considerably enlarged their strength and would today pose an even graver threat to national security.

I now come to another very critical issue which has continued to be neglected. This relates to the fundamental necessity of ensuring that all security management departments and agencies are manned by personnel who are adequately trained and equipped to perform the sensitive tasks which they are required to handle. Traditionally, appointments to posts at various levels in the Home and Defence Ministries and other security management organisations have been from among various generalist cadres. Over the years, varied problems have arisen because the large majority of those deployed in such important agencies may have had no prior experience of working in the security management arena. Serious personnel related problems have also been surfacing in the functioning of the central intelligence agencies, particularly in the Research and Analysis Wing (R&AW). For want of a well planned approach, deficiencies have been faced in regard to the availability of the required number of adequately trained and experienced functionaries who are required for manning the various organisations which comprise the union's security administration apparatus. Problems relating to the shortage of a trained human resource would pose an even larger problem once the National Security Policy has been promulgated and a significantly enlarged apparatus is required to be made operational.

In the foregoing context, it may be recalled that, nearly two decades ago, the then National Democratic Alliance (NDA) government had set up three

task forces. Of these three, the task force relating to internal security was chaired by me. Among the many recommendations which were made by this task force, I had particularly pointed to the vital importance of trained manpower being raised, in adequate strength, to progressively man the union's entire security management apparatus, all over the country. In this context, I had proposed the broad framework for raising a dedicated pool of officers by seeking volunteers from all civil, police, defence, Defence Research and Development Organisation (DRDO), science and technology, management, banking, telecom and various other arenas of functioning. It was proposed that such volunteers, after selection, should be made to undergo function and area specific training programmes and well trained persons from this pool could then be hand-picked and deployed to perform specified roles in the central security management apparatus. It was postulated that the establishment of such a specially trained cadre would put an end to the continuing ad hoc practice of deployments being made in the security administration arena of persons of diverse professional backgrounds who had no past experience of working in this arena.

The recommendations of the Internal Security Task Force (2000) were considered by a Group of Ministers (2001) chaired by the then deputy prime minister and home minister of India. After extensive discussions, the Group of Ministers, comprising the home, defence, finance and external affairs ministers and vice chairman of the Planning Commission, had approved the approach recommended by me. This decision was reflected in the "Report of the Group of Ministers on National Security" (February 2001). Considering the long period which has since elapsed, it can be safely assumed that this matter has been duly consigned to the record room.

In the past two decades, since the empowered Group of Ministers considered the recommendations of the three tasks forces, which were set up consequent to the Kargil Review Committee Report, worrying developments have taken place in our security environment. There have been significant shifts in the geopolitical environment in our neighbourhood and beyond and there are new threats to our country's interests and security. In this context, I would yet again stress that we can no longer afford to follow ad hoc and

disparate approaches in regard to national security management and the Government of India should not lose any more time in taking the full step to establish a *National Security Administrative Service* whose constituents, selected on the basis of a pan India competitive examination, should be especially trained in the various required areas, and deployed to man the Government of India's security administration system. Thereafter, members of this service could also be progressively allocated to the states for managing their security management machinery.

My concluding observation relates to the need to establish a new ministry which is entirely dedicated to the efficient implementation of every component of the National Security Policy and to keep a close and constant watch to see that the states effectively maintain internal security in their domains.

It needs being recognised that the Union Ministry of Home Affairs is faced with ever increasing day-to-day pressures on varied fronts and its senior echelons are required to deal with a horde of subjects, of which one relates to internal security management. With its existing responsibilities it would be impractical to expect this ministry to devote full time attention only to security management related issues, all of which require zero delays and immediate decisions. In this context, if national security is to be effectively managed, the time has come to establish a dedicated *Ministry of National Security Affairs* which is led by a senior, experienced Cabinet minister and manned by handpicked and especially trained functionaries drawn from the National Security Administrative Service, which I have earlier proposed.

In conclusion, I would briefly recapitulate the three main suggestions which I have made in the course of this lecture:

- The union should take urgent steps, in close consultation with the states, to evolve and promulgate the *National Security Policy* and, thereafter, draw up, and implement, a time-bound action plan to fill all existing gaps and establish a country-wide institutional framework for safeguarding the country on every front.
- For securing effective implementation, it is essential that the security administration apparatus of the union and the states is manned by well

trained and trustworthy personnel. Towards this objective, the union should establish the *National Security Administrative Service* whose cadres should man the union's security related organisations and, progressively, the security management apparatus of the states.

- The Union Home Ministry is responsible for the management of a large number of disparate subjects and is overburdened with the discharge of its day-to-day tasks. The effective implementation of the National Security Policy shall, *inter alia*, require constant oversight of each and every security related development and immediate operational decisions. It would be beneficial to lose no time in establishing a *new Ministry of National Security Affairs* which is entirely devoted to effectively safeguarding the country on every front.

Finally, I would yet again stress that if the sovereignty, unity and territorial integrity of our country is to be effectively protected, then it is of the foremost importance that the union and states act in very close concert to ensure the efficient implementation of the National Security Policy. It is equally necessary that all matters relating to national security are viewed with utmost concern and prompt decisions are taken to ensure that not the slightest chink is left to subvert the national interest.

# INDIA'S PRIORITIES AND CONCERNS IN AFGHANISTAN

SHALINI CHAWLA

In recent years, the India-Afghanistan relationship has grown at an accelerated pace and the Afghan leadership has been very appreciative of India's developmental assistance. Afghanistan's President Ashraf Ghani's visit to New Delhi in 2017 once again demonstrated Kabul's trust in New Delhi as a reliable partner. India, indeed, has been consistent in its approach with Kabul and has been engaged actively in providing development and humanitarian assistance. India-Afghanistan relations have gone through highs and lows owing to strategic developments but, by and large, post 2001, the two countries have shared a cordial relationship which has not been limited to governmental exchanges but has also been driven by strong people-to-people contacts and New Delhi's developmental engagement with Afghanistan. President Ghani's term, in fact, has seen noticeable developments in India's initiatives in Afghanistan: the construction of the Afghan Parliament and the launch of air freight corridors. India has deep-rooted civilisational ties with Afghanistan and has maintained its position as a supporting actor, with focus on development and capacity building in Afghanistan.

The geographical location of Kabul at the strategic crossroads between South Asia and Central Asia as well as South Asia and the Middle East, makes it extremely important for India. New Delhi's relationship with Kabul

---

Dr **Shalini Chawla** is Senior Fellow at the Centre for Air Power Studies, New Delhi.

**India's policy in Afghanistan faces multiple challenges, including the most significant ones posed by Islamabad and the radical Taliban which reportedly controls a large part of Afghanistan at present.**

suffered a major blow during the Taliban's seven year rule in the 1990s, when India continued to support the Northern Alliance. The fall of the Taliban regime post 9/11 once again allowed Indian diplomatic presence and engagement in Afghanistan.

India has growing stakes in peace and stability in Afghanistan. India's policy in Afghanistan faces multiple challenges, including the most significant ones posed by Islamabad and the radical Taliban which reportedly controls a large part of Afghanistan at present. India also needs to deal with the challenges posed by the growing interests of the major actors in Afghanistan: China and Russia.

## **INDIA'S OBJECTIVES IN AFGHANISTAN**

### *Shaping Regional Influence*

India has enduring problems within and in its neighbourhood, and has made efforts to move beyond these contentious issues into the wider international system. As a global player, and with its rising power image, India certainly wants to be a partner in the growth of the region. India aims to rise to power within the context of its troubled neighbourhood and the important question for the leadership in New Delhi has been regarding how India would integrate within South Asia.<sup>1</sup> The political leadership has made efforts for regional integration and the shaping of a stable Asian order. The determinants of power normally include the size of a country, its population, economic growth, military modernisation, the competence of its industry and industrial growth, its natural resources and its capability to influence policy making at the global level. A country's power is also determined by the influence it exercises in its neighbouring states, what Joseph Nye termed as

---

1. For details, see Sandy Gordon, *India's Rise as an Asian Power: Nation, Neighborhood and Region*, (New Delhi: Foundation House, 2015), p. xxi.

“soft power”. The regional influence could also be a mix of soft and hard power depending on the relationship with the specific country, which was termed as “smart power” by Joseph Nye. India’s steps in Afghanistan have to be viewed in this context of shaping regional influence.

India has had historical and cultural linkages with Afghanistan and has always worked towards strengthening its ties with Kabul. Assistance to Afghanistan is part of India’s strategy to carve out its own position in South Asia as an influential regional power.

India’s posturing as an important player in the region helps in achieving its strategic objectives. India’s economic and military growth in the last decades has been significant, and has complemented its strategy to expand its regional influence. New Delhi wants to establish its credentials as a preeminent power, has stakes in the stability of the region and is eager to invest in regional peace and development. Needless to say that India’s geographical size, skilled human resource, large young population and positive economic growth allow it to take that positioning. India has managed to expand its soft power reasonably in Afghanistan, and the Afghans view India as a stabilising influence.

India’s growth as an economic power and its integration into the global economy has led to its image boost and, more importantly, the positive perception that it can assist in strengthening the stability. Moreover, New Delhi, as a responsible big power, cannot afford to have an unstable Afghanistan in its neighbourhood. While India has tried to build a balance in its engagement with different ethnic groups in Afghanistan, the balance was tilted in favour of the Pashtuns during Karzai’s period when India became quite vocal about its support to President Karzai. The former Afghan leader has close ties with India, given the fact that he is educated in India and one of his children was born in India. President Ghani too looks towards India

**While India has tried to build a balance in its engagement with different ethnic groups in Afghanistan, the balance was tilted in favour of the Pashtuns during Karzai’s period when India became quite vocal about its support to President Karzai.**



for support and has displayed consistent trust in India's will and ability to assist Afghanistan's development.

### *Countering Pakistan's Anti-India Moves*

Pakistan's role in Afghanistan caters to its deep strategic interests which are in contradiction with stability in Afghanistan. For more than three decades, Pakistan has been adopting policies to fulfill its desire to create *strategic depth* in Afghanistan. Pakistan's military leadership and its intelligence agency, which authored and executed the policy of strategic depth in the late 1980s through to the 1990s, when it strongly backed the Taliban, still strongly believes in having control over Afghanistan. The aim of gaining strategic depth in Afghanistan was never a viable or logical option and is considered a strategic blunder which further facilitated Pakistan's drift into extremism and did not allow it to alter its strategic calculus. Pakistan's strategy did not succeed in Afghanistan and none of its objectives, including controlling the Pashtun nationalism at the border, the lingering Durand Line issue, or countering the Indian presence in any form in Afghanistan, was actually fulfilled. However, Pakistan's influence and its desire to pursue its objectives have not allowed Kabul to stabilise.

Pakistan has consistently tried to thwart India's efforts and moves in Afghanistan. For Islamabad, Afghanistan was one of the most logical choices to be used to balance India's influence in South Asia. A pro-India regime in Afghanistan was never acceptable to Islamabad as it would counter Pakistan's objectives in Afghanistan. Pakistan does have a leverage in Afghanistan due to the Pashtun-ethnic linkage.

Pakistan has followed the strategy of covert war through terrorism against India for more than 35 years now. It adopted the covert war strategy as early as 1947 when it launched its first aggression against India under the guise of a tribal revolt. In the 1965 War, Pakistan's aggression through covert war was launched with Operation Gibraltar, followed by the overt Operation Grand Slam. In the 1980s and 1990s, Pakistan accelerated its covert activities through proxy war not only in the Kashmir Valley but also in other parts of India (Punjab). Pakistan's covert war activities and its policy to use terrorism as a

foreign policy tool against India, accelerated since the late 1980s, which could be correlated to the expertise it had gathered as a frontline state during the Afghan War. Islamabad's acquisition of nuclear technology in 1987 further strengthened its confidence to initiate acts of terror, as the nuclear capability was to act as a shield against Indian retaliation in response to terrorism.

Afghanistan provided Pakistan a safe haven to train the anti-India state sponsored groups: Harkat-ul-Mujahideen (HuM), Jaish-e-Muhammad (JeM) and Lashkar-e-Taiba (LeT). These groups have been actively conducting terrorist activities in Jammu and Kashmir (J&K) and also in other parts of India. One of the prime objectives of Pakistan in pursuing its strategy of strategic depth was to use Afghanistan as a sanctuary to train and equip anti-India terror groups. All the groups are trained in Afghanistan, with varying proximity to the Taliban and, by extension, Al Qaeda. There have been several attacks on the Indian Embassy, diplomats, and workers, with the Taliban's assistance, in Afghanistan, constraining India's ability to work. It is essential for India to have firm ground in Afghanistan and retain its political and diplomatic influence in Kabul to be able to control Islamabad's ambitions.

For Pakistan, it is desirable that India's role gets restricted as it would provide Islamabad ample space to pursue its objectives. Pakistan desires a pro-Pakistan government in Kabul which would facilitate its ambitions of controlling Pashtun nationalism on its borders, using Afghanistan as a sanctuary against India, using Afghanistan's territory during any future India-Pakistan War, and catering to the commercial interests of the Inter-Services Intelligence (ISI) which have developed over the decades in the form of illicit activities, including drug trade, in Afghanistan. In the 1990s, the leadership in Islamabad not only created, but fully assisted the radical Taliban regime in Afghanistan to be able to maintain its control in the region and also deny space to India. In 2003, when the US was distracted in Iraq, Gen Musharraf facilitated the resurgence of the Taliban in Afghanistan. The Taliban has reestablished itself in Afghanistan now and controls a significant part of the territory. Afghanistan, in fact, is riddled with complex security challenges, with the Taliban, Al Qaeda

and Islamic State in Iraq and Syria (ISIS) spreading their tentacles (Fig 1). According to the reports of Resolute Support, as of October 2017, about 56 percent of the country's districts were under the Afghan government's control, 30 percent were contested, and around 14 percent, under the insurgents' control.<sup>2</sup> However, there have been also reports in early 2018, suggesting that the Taliban are active in 70 percent of Afghan territory.<sup>3</sup> It is prudent for India to maintain and extend its engagement in Kabul to be able to contain Islamabad's ambitions in Kabul.

Fig 1: Taliban Control in Afghanistan (2017)



Source: <https://twitter.com/reuterspakistan/status/846248966287122432>. Accessed on January 30, 2018.

2. "The Taliban is Gaining Strength and Territory in Afghanistan", *NBC News*, January 30, 2018.
3. "Taliban Active in 70 Percent of Afghanistan, BBC Study Finds", *Reuters*, January 31, 2018, <http://in.reuters.com/article/afghanistan-taliban-study/taliban-active-in-70-percent-of-afghanistan-bbc-study-finds-idINKBN1FK065>. Accessed on February 1, 2018.

*Afghanistan Should not Become the Sanctuary of Islamic Extremism*

One of the major concerns of India is to control the spread of Islamic extremism. India has suffered terrorism backed by Islamic extremism in the Kashmir Valley and also in other parts of India (Punjab). The problem of Islamic extremism in Pakistan and Afghanistan affects India both directly and indirectly. Since a majority of the anti-India groups which have been nurtured by Pakistan for decades have their support base in Afghanistan, and draw their ideological and logistical support from the international terrorist organisations based there, India's concerns regarding the spread of extremism in Afghanistan are not unjustified.

The Soviet occupation of Afghanistan in the 1980s and the nurturing of the Mujahideen force by the US Central Intelligence Agency (CIA), with Pakistani assistance, created a substantive infrastructure for *jihād* in Afghanistan. Terrorism in Kashmir accelerated much more in the 1980s and later in the 1990s, as the ISI now had more resources and experience to conduct insurgency in India. After the Soviet withdrawal in the late 1980s from Afghanistan, terrorism increased in India as the entire resource base created for the Russians was now being used against India.

In the last decade, Afghanistan has seen the rise of extremism and non-state actors have been challenging the stability of the Afghan state. Al Qaeda has managed to maintain its foothold in Afghanistan and has been actively supporting the Afghan Taliban, and also the Taliban factions in Pakistan. It is in India's interest to have active developmental engagement with Kabul to be able to contribute towards the Afghan efforts of countering extremism in the nation.

*Afghanistan: India's Gateway to Central Asia*

Afghanistan is certainly India's gateway to Central Asia where New Delhi wants to expand its presence due to its inflating energy requirements. According to the World Bank ICP Report 2011, India is the third largest economy in the world by its share of the world Gross Domestic Product

**India is keen on the imports of oil and uranium from both Kazakhstan and Uzbekistan. Turkmenistan is the fourth largest gas reserve holder and one of the top natural gas producers. Other major powers like the US, China and Russia have already started to expand their role and influence in Central Asia. Consequently, New Delhi needs to adopt an assertive policy to be able to maintain its influence.**

(GDP) in Purchasing Power Parity (PPP) terms.<sup>4</sup> The US Department of Agriculture has said that India was “the fastest growing economy since 2000”.<sup>5</sup> Reportedly, India imports approximately 70 percent of its overall demand for fossil fuel. Given the fact that the Indian economy is growing at a rapid pace, the energy requirements for India are obviously high and it is the fourth largest energy consumer in the world. Central Asia, with its rich natural energy resources, is vital for India. Afghanistan is certainly the most feasible route to Central Asia for

New Delhi. India is keen on the imports of oil and uranium from both Kazakhstan and Uzbekistan. Turkmenistan is the fourth largest gas reserve holder and one of the top natural gas producers. Other major powers like the US, China and Russia have already started to expand their role and influence in Central Asia. Consequently, New Delhi needs to adopt an assertive policy to be able to maintain its influence.

India started to expand its military profile in Central Asia in 1999 after the hijacking of the Air India flight from Kathmandu, which led to the release of three high profile terrorists from India. India set up its first military base in Farkhor in Tajikistan to be able to assist the Northern Alliance fighters in Afghanistan, and later to support the post-Taliban government in Afghanistan. India's air facility in Ayni in Tajikistan has been used to provide humanitarian assistance to Afghanistan.

- 
4. “2011 International Comparison Program Summary Results Release Compares the Real Size of the World Economies”, The World Bank, April, 29, 2014, <http://www.worldbank.org/en/news/press-release/2014/04/29/2011-international-comparison-program-results-compare-real-size-world-economies>. Accessed on December 15, 2014.
  5. Shalini Chawla, “Asia and Africa and Post-2015 Development Agenda”, in Pedro Miguel Amakasu, David Arase and Scarlett Cornelissen, eds., *Routledge Handbook of Africa-Asia Relations* (London: Routledge, 2018), p. 360.

In 2008, the agreement for the Turkmenistan-Afghanistan-Pakistan-India (TAPI) pipeline was an important development, given India's energy as well as strategic requirements. Finally, after a series of negotiations, a breakthrough was achieved in the megaproject and the construction of TAPI began in 2015. TAPI (when completed) will create the first overland link between Central Asia and India and alter the pattern of connectivity of Central Asia. TAPI would also diversify the exports of gas from Turkmenistan. After the decline in exports by Russia, China became the largest importer of gas from

Turkmenistan. The route of the \$10 billion pipeline traverses Kandahar province of Afghanistan and Quetta in Pakistan, and both regions are known for the Taliban insurgency. There were considerable delays in the commencing of the pipeline project due to the threats involved in it. The pipeline is scheduled to be operational by 2019.

In 2012, India launched its Connect Central Asia Policy (CCAP) which involves greater diplomatic, political and economic engagement at various levels between the states. The CCAP was launched in the first meeting of the India-Central Asia Dialogue, in Bishkek, Kyrgyzstan, to fast-track India's relations with the Central Asian Republics (CARs). In his keynote address Minister of State (MoS) Shri E. Ahamed said:

I believe that India's active presence in the region will contribute to stability and development in the entire Central and South Asia region. In this analysis, we must factor in the regional situation and especially the challenge of rebuilding the Afghan nation. A cooperative approach for embedding Afghanistan into a more meaningful regional economic and security framework would have benefits for the entire region. One way is to work

**In 2012, India launched its Connect Central Asia Policy (CCAP) which involves greater diplomatic, political and economic engagement at various levels between the states. The CCAP was launched in the first meeting of the India-Central Asia Dialogue, in Bishkek, Kyrgyzstan, to fast-track India's relations with the Central Asian Republics (CARs).**

towards converting Afghanistan into a hub for trade and energy, connecting Central and South Asia. The landmark agreement for the construction of the TAPI (Turkmenistan-Afghanistan-Pakistan-India) pipeline has put the spotlight on the importance of Central Asia for India's future energy plans. It would also greatly benefit Afghanistan.<sup>6</sup>

The CCAP comprises a broad-based approach and India aims to:

- Continue to build strong political relations through the exchange of high level visits.
- Strengthen strategic and economic cooperation.
- Step up multilateral engagement with Central Asia through existing forums like the Shanghai Cooperation Organisation (SCO), Eurasian Economic Community and Customs Union.
- Establish partnerships in energy and natural resources.
- Cooperate in the medical, education and e-sectors.<sup>7</sup>

In 2015, the visit of the Indian prime minister to all the five Central Asian countries raised the profile of India-Central Asia relations. During the prime minister's visit, 22 agreements in different fields were signed.<sup>8</sup> However, so far India's ability to enhance its trade with Central Asia has been restricted due to the lack of direct transport access. Chabahar port in Iran will significantly help India to procure Central Asia's resources. India's presence and engagement in Central Asia will also strengthen its ability to engage in Afghanistan's developmental process.

---

6. Keynote Address by MoS Shri E. Ahamed at First India-Central Asia Dialogue, June 1, 2012, <http://www.mea.gov.in/Speeches-Statements.htm?dtl/19791/Keynote+address+by+MOS+S+hri+E+Ahamed+at+First+IndiaCentral+Asia+Dialogue>. Accessed on July 12, 2014.

7. Ibid.

8. See Ministry of External Affairs, Annual Report 2015-2016, [https://www.mea.gov.in/Uploads/PublicationDocs/26525\\_26525\\_External\\_Affairs\\_English\\_AR\\_2015-16\\_Final\\_compressed.pdf](https://www.mea.gov.in/Uploads/PublicationDocs/26525_26525_External_Affairs_English_AR_2015-16_Final_compressed.pdf) . Accessed on July 15, 2016.

## **INDIA-AFGHANISTAN: DEVELOPMENT PARTNERSHIP**

While India's role was constrained in Afghanistan during the anti-Soviet *jihad* between 1979-89, it did try to extend its support and activities in Kabul after the Soviet withdrawal. Also, during the time of the Taliban regime in the 1990s, India's role remained restricted. Post 2001, the focus of the Indian activities has been on developmental projects, including industrial and hydro projects, education and health sectors as well as humanitarian assistance. India's role post 2001 needs to be analysed not only in the context of the historical ties between Kabul and New Delhi, but also India's changing stature and role on the global platform, with its growing power, economy and image.

India is a key donor to Afghanistan and the cumulative level of commitment of Indian assistance to Afghanistan amounts over US\$2 billion. The Strategic Partnership Agreement signed between India and Afghanistan in 2011 provided a further boost to the relationship. India is the fifth largest provider of developmental assistance to Afghanistan with the total commitment for 2013-14 at approximately US\$120 million<sup>9</sup> (Fig 2). The period (till 2014) was critical as the US withdrawal was ongoing and Afghanistan required much needed support from India. India's grants and loan-based allocations for Afghanistan remained unaltered between Financial Year (FY) 2014-15 and FY 2015-16 (Fig 3) and India's commitments to Afghanistan stood at INR 6.76 billion.<sup>10</sup>

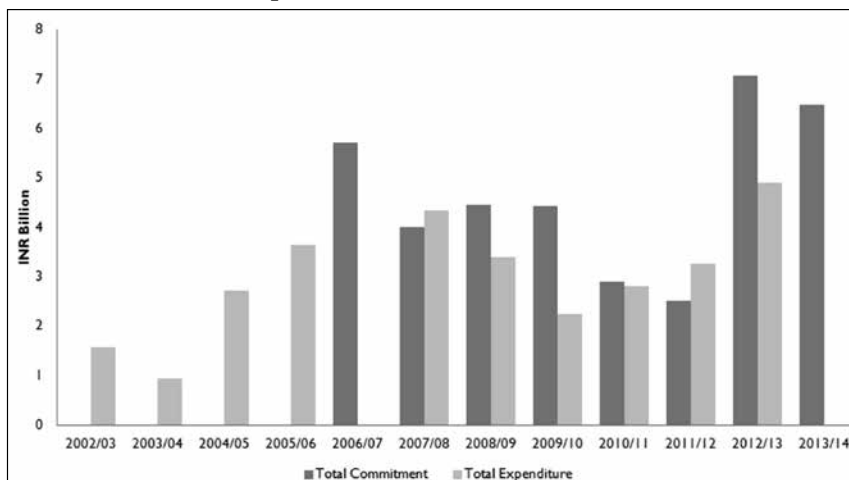
---

9. Rani D. Mullen, "India –Afghanistan Partnership", Indian Development Cooperation Research, <http://idcr.cprindia.org/blog/india-afghanistan-partnership>. Accessed on April 14, 2015.

10. "Update on Afghanistan-India Relations", Indian Development Cooperation Research, April 25, 2015, <http://idcr.cprindia.org/blog/update-afghanistan—india-relations>. Accessed on May 25, 2015.

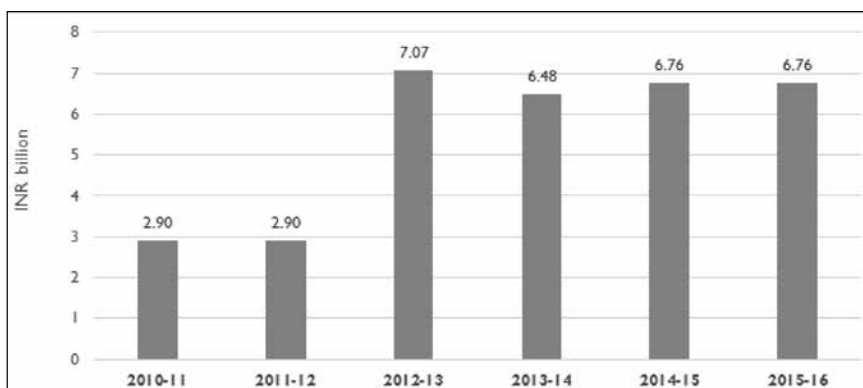


**Fig 2: India's Development Cooperation with Afghanistan: Commitments and Expenditures, 2002/03 – 2013/14**



Source: Preliminary calculations by the Indian Development Cooperation Research (IDCR) at the Centre for Policy Research, New Delhi, based on data from the Ministry of External Affairs (MEA) Outcomes Budgets 2006/07-2013/14, Government of India, and Union Budgets 2002/03 - 2013/14, Ministry of Finance, Government of India, as cited in Rani D. Mullen, "India –Afghanistan Partnership", Indian Development Cooperation Research, <http://idcr.cprindia.org/blog/india-afghanistan-partnership>.

**Fig 3: Indian Grant and Loan-based Commitments to Afghanistan in INR Billion (between 2010-11 and 2015-16)**



Source: Calculations by the Indian Development Cooperation Research (IDCR) initiative at the Centre for Policy Research, New Delhi, based on publicly available data from the Union Budget 2014-15, Ministry of Finance, Government of India, as cited in "Update on Afghanistan-India Relations", Indian Development Cooperation Research, April 25, 2015, <http://idcr.cprindia.org/blog/update-afghanistan-india-relations>. Accessed on May 25, 2015.

According to a report by the Ministry of External Affairs (MEA), most of India's development projects in Afghanistan can be broadly divided into four categories:<sup>11</sup>

- Large infrastructure projects.
- Humanitarian assistance.
- Capacity building initiatives.
- Small development projects.

India has initiated several medium and large infrastructure projects in its assistance programme in Afghanistan. Some of the important projects include:

- Construction of the 218-km road from Zaranj to Delaram for facilitating the movement of goods and services to the Iranian border. (The project has been completed and handed over to the Government of Afghanistan.)
- Construction of the 220KV DC transmission line from Pul-e-Khumri and a 220/110/20 KV sub-station at Chitkala. (The project has been completed and handed over.)
- Expansion of the national TV network by providing an uplink from Kabul and downlinks in all 34 provincial capitals, for greater integration of the country.<sup>12</sup>

Completion and inauguration of the Salma Dam known as Afghan-India Friendship Dam in 2016, highlights not only the efforts of about 1,500 Indian and Afghan professionals but also India's commitment to Afghanistan's development.<sup>13</sup> Construction of the Afghan Parliament has been another significant initiative as a part of Indian assistance. Afghanistan is extremely rich in minerals but the exploitation of the minerals remains a challenge. India is keen to encourage investment for sustainable development and

---

11. "Development Partnership: India's Assistance Programme for Afghanistan", Indo-Afghan Relations, Embassy of India Kabul, Afghanistan, Ministry of External Affairs, Government of India, <http://eoi.gov.in/kabul/?0707?000>. Accessed on June 5, 2015.

12. Development Partnership, Embassy of India, Kabul, Ministry of External Affairs, [www.mea.gov.in/Portal/Foreign\\_Relation/1Afghanistan\\_October\\_2017.pdf](http://www.mea.gov.in/Portal/Foreign_Relation/1Afghanistan_October_2017.pdf). Accessed on February 9, 2018.

13. Indo-Afghan Relations, Embassy of India, Kabul, Afghanistan, [www.eoi.gov.in/kabul/?0707?003](http://www.eoi.gov.in/kabul/?0707?003). Accessed on January 30, 2018.

**India is one of the leading donors in Afghanistan and by far the largest regional donor, but its role has been constrained, given the complex security situation and Pakistan's continuous unhappiness over India's presence as well as soft power in Kabul.**

a consortium of public and private Indian companies has been formed to encourage investment in Afghanistan's mining sector in the Haigak iron ore mine.<sup>14</sup>

Under humanitarian assistance, the Indian efforts include:

- Commitment to supply 1.1 million metric tonnes (MT) of wheat to Afghanistan (711,882 MT of wheat or equivalent in cash has already been delivered at a cost of Rs. 989.45 crore).
- Commitment to contribute US\$ 1 million annually over the next five years to

the Afghan Red Crescent Society for the treatment of Afghan children with congenital heart diseases."<sup>15</sup>

Capacity building has been a significant area of Indian assistance to the Afghans. According to the MEA report, "The Government of India offers training to Afghan officials/nationals in diverse fields through 500 ITEC slots and 25 slots under the TCS Colombo Plan are allocated annually to Afghanistan."<sup>16</sup> Other critical capacity building initiatives include: Indian Technical and Economic Cooperation (ITEC) courses for Afghan government officials, training via telecommunication at medical facilities and Indian Council for Social Science Research (ICSSR) fellowships for Afghan students. The ICSSR scholarships have been extended till 2020.<sup>17</sup>

Small Development Projects (SDPs) have been initiated in the fields of agriculture, rural development, vocational training, education, health, etc. According to an MEA report, the SDPs have been implemented in three phases. Under Phases I and II, US\$ 20 million was committed, and 132 projects, at the cost of about US\$19.5 million, were approved. Out of 132 projects,

---

14. n. 12.

15. n. 13.

16. Ibid.

17. Ibid.

94 have been completed.<sup>18</sup> Under Phase III, a total of 287 projects at approximately US\$ 52.5 million, have been approved and are at varied stages of implementation.<sup>19</sup>

#### INDIA'S SOFT POWER IN AFGHANISTAN

India is one of the leading donors in Afghanistan and by far the largest regional donor, but its role has been constrained, given the complex security situation and Pakistan's continuous unhappiness over India's presence as well as soft power in Kabul. The efforts by the Indian government clearly indicate that New Delhi believes that sustainable development of Afghanistan requires long-term investment. Specifically, investment that can assist the exploitation of Afghanistan's natural resources. A stable Afghanistan is essential for regional stability. According to India's former Ambassador to Afghanistan, Shri Jayant Prasad,

**India's developmental initiatives impact the Afghan society directly and some of the high profile Indian projects like the building of the Afghan Parliament, donation of planes to Ariana Afghan Airlines create a significant, positive image of India.**

India's objective is to stabilize Afghanistan. Getting the Afghans to stand on their own feet is good for the Afghan people, good for India and good for the world, including all the regional countries.<sup>20</sup>

India's influence in Afghanistan is quite significant and India is able to wield a considerable amount of soft power. On August 30, 2009, in a confidential report submitted to US President Obama, Gen Stanley McChrystal wrote:

Indian political and economic influence is increasing in Afghanistan, including significant development efforts and financial investment. In addition, the current Afghan government is perceived by Islamabad as

---

18. Ibid.

19. Ibid.

20. Jayant Prasad, Indian ambassador to Afghanistan, in an interview, "In Afghanistan, Indians are Praised Simply for Being Indian", *Business Standard* (New Delhi), October 9, 2009.

pro-Indian. While Indian activities largely benefit the Afghan people, increasing Indian influence in Afghanistan is likely to exacerbate Pakistani countermeasures in Afghanistan or India.<sup>21</sup>

As a multi-ethnic democracy with a growing economy, India is able to project an extremely positive image. India's developmental initiatives impact the Afghan society directly and some of the high profile Indian projects like the building of the Afghan Parliament, donation of planes to Ariana Afghan Airlines create a significant, positive image of India. The Bollywood movie industry—which makes close to 800 movies every year, portraying glamorous lifestyles and events—has permeated Afghan society.<sup>22</sup> These cultural products have penetrated deep into the Afghan society and are greatly appreciated by the Afghans. One of the most popular TV shows in Afghanistan is an Indian soap dubbed in Dari.<sup>23</sup> The entertainment industry and the education sector impact the youth in a country and India's role in these sectors has helped it to garner support from the Afghan youth.

India has also made an effort to create linkages with the Afghan elites who have had long standing ties with India. Hamid Karzai, for example, studied in India in Himachal Pradesh and speaks fluent Hindi, and Afghan Chief Executive, Abdullah Abdullah's wife resides in New Delhi. There have been specific efforts to increase business partnerships with Afghanistan which has attracted the elite business personnel from Afghanistan, further building up credibility for India. For example, the Investment Roadshow in Ahmedabad in 2014, the participation of the Afghan delegation in the India Mining Summit in 2014, the inauguration of the 'India Bazaar' in Kabul in 2014, and the participation of Afghan businessmen in PHARMEXCIL 2015, in Gujarat.<sup>24</sup> According to a Ministry of External Affairs report, there have

---

21. Ajay Prakash, "Rising Indian Influence in Afghanistan Worries US and Pakistan", WSWS.org, November 19, 2009, <http://www.countermeasures.org/print.html>. Accessed on April 12, 2013.

22. "What is Bollywood", *Newsround*, undated, as cited in Larry Hanauer and Peter Chalk, "India's and Pakistan's Strategies in Afghanistan: Implications for the United States and the Region", Occasional Paper, RAND, Centre for Asia Pacific Policy, 2012, p. 21.

23. Shashi Tharoor, "Hooray for Bollywood: India's 'Soft Power'", *Taipei Times*, January 7, 2008, as cited in Hanauer and Chalk, *Ibid.*, p. 21.

24. "India-Afghanistan Relations", Ministry of External Affairs, [https://www.mea.gov.in/Portal/ForeignRelations/Afghanistan\\_Dec2014.pdf](https://www.mea.gov.in/Portal/ForeignRelations/Afghanistan_Dec2014.pdf). Accessed February 20, 2018.

been ongoing visits of business delegations from both countries, including the conference and exhibition on “Made in Afghanistan” from July 19-20, 2016, and the 9th MP Expo, from January 29-31, 2016.<sup>25</sup>

In an encouraging move, the first Kabul-New Delhi air corridor was inaugurated by President Ghani in June 2017. According to the Afghan officials, goods worth more than \$20 million, including, 10,640 tonnes of fresh produce, fresh and dried fruits, handicrafts, etc have been exported to India since the launch of the corridor.<sup>26</sup> The second route was officially launched in December 2017.<sup>27</sup> Air corridors between India and Afghanistan are the key to increase Afghan exports (especially fruits and dry fruits) to India and also other parts of the world, which could be facilitated by India. The corridor will also facilitate Indian assistance to Afghanistan. The reactions in Pakistan following the launch of the first air corridor were adverse, as expected. Islamabad, in a much predicted reaction, sees this development as an Indian way to isolate Pakistan. The corridors provide flexibility to the Afghan traders to export their products without being reliant on Pakistan where they face constant impediments.

### **DEVELOPMENT OF THE CHABAHAR PORT**

Iran has interests in the stability of Afghanistan and is trying to increase its influence in Kabul, using its oil money. It has been keen on the withdrawal of the US and North Atlantic Treaty Organisation (NATO) troops from Afghanistan, as the US presence in Afghanistan impacts Iran’s ability to engage in Kabul. Iran did not support the Taliban regime in Afghanistan in the 1990s and has been a supporter of the Northern Alliance in the past, along with India. Iran has been concerned about Pakistan’s activities in Afghanistan and is uncomfortable in adjusting to Pakistan’s intentions of supporting a fundamentalist Sunni regime in Kabul. Islamabad’s close association with Saudi Arabia and long alliance with the US do not go down well with Iran. Pakistan has, for decades, tried

---

25. “India-Afghanistan Relations”, Ministry of External Affairs, February 2016, [http://www.mea.gov.in/Portal/ForeignRelation/Afghanistan\\_17\\_02\\_2016.pdf](http://www.mea.gov.in/Portal/ForeignRelation/Afghanistan_17_02_2016.pdf). Accessed on March 11, 2016.

26. “India, Afghanistan Launch Second Air Corridor linking Kabul and Mumbai”, *Hindustan Times*, December 27, 2017.

27. *Ibid.*

**Afghanistan has shifted 80 percent of its cargo traffic from Karachi port to Iran's Bandar Abbas and Chabahar ports. The move of traffic to the Iranian ports was triggered by Pakistan's decision to impose trade tariff.**

to curtail its influence in bordering Balochistan, and a substantive amount of Saudi resources and funds have been invested in the *madrassas* preaching Wahabi Islam in Balochistan and the border regions of the Federally Administered Tribal Areas (FATA) and Khyber Pakhtunkhwa (KPK). Thousands of *madrassas* which flourished in the 1980s catering to the requirements of the CIA's war against the Russians, with Pakistan as the frontline state, produced the top leadership of the Taliban, which is active in Afghanistan and Pakistan. Although Pakistan's clandestine nuclear network did cater to the Iranian nuclear ambitions, Iran has not been comfortable with the growing nuclear arsenal of Pakistan.

India and Iran have common interests in the stability of Afghanistan and both countries are concerned about the spillover effects of extremism in the country. India finalised the deal with Iran for the development of the strategic port of Chabahar in Iran and a Memorandum of Understanding (MoU) was signed between the two governments in May 2015. The objectives of the MoU were clearly indicated in the statements of the Indian Ministry of External Affairs, "With the signing of the MoU, the Indian and the Iranian entities would be in a position to commence negotiations towards finalization of a commercial contract under which Indian firms will lease two existing berths at the port and operationalize them as container and multipurpose cargo terminals."<sup>28</sup> Also, "the availability of a functional container and multipurpose cargo terminal at Chabahar port would provide Afghanistan's garland road network system alternate access to the sea port, significantly enhancing Afghanistan's overall connectivity to regional and global markets."<sup>29</sup>

The port is of critical importance to India as it is expected to significantly reduce transportation costs and freight time for India to reach Central Asia,

---

28. "Inter-Governmental MoU between India and Iran", Press Release, May 6, 2015, [http://mea.gov.in/press-releases.htm?dtl/25185/InterGovernmental\\_MoU\\_between\\_India\\_and\\_Iran](http://mea.gov.in/press-releases.htm?dtl/25185/InterGovernmental_MoU_between_India_and_Iran). Accessed on June 5, 2015.

29. Ibid.

Russia, Europe and the Gulf. The Chabahar port allows India to reach Afghanistan bypassing Pakistan and its efforts in Afghanistan are likely to get a significant boost with the operationalisation of the port. The first phase of the Shahid Beheshti terminal at Chabahar port was inaugurated on December 3, 2017. Chabahar has two terminals: Shahid Kalantari and Shahid Beheshti. The first terminal is handling around 2.1 million tonnes of cargo per year, and the capacity is expected to go up to 10 million tonnes with the operationalisation of Shahid Beheshti.<sup>30</sup>

Afghanistan is clearly celebrating the operationalisation of Chabahar as it

will no longer be dependent on Pakistan for a transit route for its shipments.<sup>31</sup> Afghanistan has shifted 80 percent of its cargo traffic from Karachi port to Iran's Bandar Abbas and Chabahar ports. The move of traffic to the Iranian ports was triggered by Pakistan's decision to impose trade tariff.<sup>32</sup> Many Pakistani business are of the opinion that more Afghanistan trade will eventually shift to Chabahar, causing a severe blow to bilateral trade between Afghanistan and Pakistan. The business communities of KPK and Balochistan are likely to suffer severe financial losses.<sup>33</sup>

**India's interests in Afghanistan have multiple dimensions ranging from expansion of its regional influence; building its soft power; trade and commerce; countering the growth of Islamist extremism from Afghanistan; and deterring Pakistan from using Afghanistan as a territory for sponsoring terrorism against India. India has been primarily focussed on developmental and humanitarian assistance in Afghanistan.**

---

30. P. Stobdan, "To make Chabahar a 'Game Changer,' Central Asian States Need to be Roped in", *IDSAs Comment*, December 12, 2017, [http://idsa.in/idsacomments/to-make-chabahar-a-game-changer-central-asain-states\\_pstobdan\\_121217](http://idsa.in/idsacomments/to-make-chabahar-a-game-changer-central-asain-states_pstobdan_121217). Accessed on January 15, 2018.

31. "With Chabahar, Pakistan is no Longer Dependent on Pakistan: Abdullah", *The Hindu*, November 15, 2017, <http://www.thehindu.com/news/international/with-chabahar-afghanistan-is-no-longer-dependent-on-pakistan-abdullah/article20449935.ece>. Accessed on December 1, 2017

32. F. M Shakil, "Chabahar Port Lures Afghan Traffic Away from Karachi", February 2, 2018, *Asia Times*, [www.atimes.com/article/afghan-port-shift-adds-pakistan-economic-woes](http://www.atimes.com/article/afghan-port-shift-adds-pakistan-economic-woes). Accessed on January 10, 2018.

33. *Ibid.*



### **ANALYSING INDIA'S ENGAGEMENT IN AFGHANISTAN**

India's interests in Afghanistan have multiple dimensions ranging from expansion of its regional influence; building its soft power; trade and commerce; countering the growth of Islamist extremism from Afghanistan; and deterring Pakistan from using Afghanistan as a territory for sponsoring terrorism against India. India has been primarily focussed on developmental and humanitarian assistance in Afghanistan. Although there has been security cooperation and India continues its commitment to building capacity within the Afghanistan National Army and Afghanistan National Police, it has refrained from putting boots on the ground and providing direct military assistance in the Afghan crisis. President Ghani has expressed his unhappiness over New Delhi's resistance to intervene militarily in Afghanistan. India has delivered four combat helicopters to Afghanistan and has been actively conducting training of the Afghan troops but intervening militarily in Afghanistan is certainly not in India's interest. The world's strongest militaries (the US and NATO) have continued to fight the Taliban insurgency for 16 years and have been unable to counter it. It is unrealistic to presume that India's military would benefit the situation militarily in Afghanistan. The Afghan crisis, arguably, cannot be dealt with militarily but needs to be addressed through negotiations and non-military regional initiatives. Also, Indian boots on the ground has a strongly likelihood of opening another front of conflict with Pakistan on the Afghan territory which would worsen the security situation. Islamabad has, till now, tried to obliterate all Indian efforts in Afghanistan. The Taliban insurgency in Afghanistan enjoys Pakistan's support and there cannot be stability in Afghanistan without Pakistan altering its strategic choices. Also, it is important to remember that Pakistan had assisted in the establishment of the Taliban regime in Kabul in the 1990s primarily with the objective of restricting India's engagement in Afghanistan.

President Ashraf Ghani, soon after coming into power, in a much *expected* move, reached out to Pakistan for help. Although the leadership in Islamabad was rather surprised at Ghani's move, as it was totally different from his predecessor Karzai's approach of relying on India and frequently visiting New Delhi for support, President Ghani was

being realistic in his approach and the natural choice for Kabul has to be Pakistan which is actually the cause of all its problems. New Delhi reacted with maturity to Ghani's move (of approaching Islamabad) and handled the situation rather diplomatically. Ghani has been extremely candid about his expectations from Islamabad. Over the last two years, the Afghan leadership has been extremely disappointed with Pakistan's continued support to the Taliban and Haqqani network. Former President Karzai and President Ghani have both openly condemned Pakistan's support to the Afghan Taliban which has not allowed peace in Kabul. During his visit to New Delhi in 2017, Ghani very clearly said that Afghanistan "would like a push factor from Pakistan vis-a-vis the Taliban, not a Pakistan-managed peace process with the Taliban".<sup>34</sup>

Post US and NATO troops' withdrawal, the security situation in Afghanistan has deteriorated significantly and, the Taliban has expanded much beyond the control of the Afghan forces and the US forces. It is estimated that there are more than 60,000 Taliban recruits operating from Afghanistan. On the other hand, there has been enhanced interest and engagement by the major powers, China and Russia, in Afghanistan. China is driven by its economic and security concerns in Afghanistan and has not only invested in Afghanistan but has been active in peace initiatives. Russia also is concerned about the security dimension and a likely spillover of rising extremism and terrorism in Afghanistan towards Central Asia and Russia. Engagement of the major powers can be beneficial if there is coordination of efforts between the countries and *Afghan stability and development* is prioritised. Unfortunately, India's engagement is seen as a security threat by both Pakistan and China. This raises serious challenges for India's engagement in Afghanistan.

---

34. Text of President Ghani's address at Vivekananda International Foundation, available at Office of the President, Islamic Republic of Afghanistan, <https://president.gov.af/en/speech/president-mohammad-ashraf-ghanis-remarks-at-vivekananda-international-foundation-vif/>, October 25, 2017. Accessed on October 26, 2017.

India has established its credibility in Afghanistan with the leadership and masses and continues to enjoy soft power, according to the polls.<sup>35</sup> It is in New Delhi's interest to continue with its developmental efforts in Afghanistan as sustained long-term investment will invariably be a key to stability in the country. Evaluation of the past efforts by India is a must to be able to deliver more productively.<sup>36</sup> Indian efforts to increase transport links with Afghanistan comprise a brilliant move. In a recent development, negotiations are underway to enable Afghan trucks to carry Indian goods from Wagah to Afghanistan—earlier, they could only bring Afghan goods to Wagah.<sup>37</sup> Also, India's initiative of developing Chabahar port in Iran would open up new links to Afghanistan, strengthening the trade and strategic relationship between the two nations.

India has faced continued resistance from the Taliban and other groups (some backed by Pakistan) in its efforts but these should not restrict its commitment to move ahead in its developmental initiatives. India should continue to work towards remaining the most popular country in Afghanistan. Recent developments, including Chabahar port, have the potential for India to consider adopting an integrated approach involving other powers like the Central Asian countries and Russia, in some of its initiatives in Afghanistan. The security situation in Afghanistan undermines New Delhi's efforts in the country. Thus, joint and forceful action against the common challenges of terrorism and extremism, along with the other actors, needs to be considered seriously for regional stability.

---

35. "Afghan Poll," BBC News, December 6, 2010. Accessed on June 13, 2016, [http://news.bbc.co.uk/2/shared/bsp/hi/pdfs/06\\_12\\_10\\_afghanpoll.pdf](http://news.bbc.co.uk/2/shared/bsp/hi/pdfs/06_12_10_afghanpoll.pdf); "PM Narendra Modi's Speech in US Congress: Read the Full Text," *Indian Express*, June 10, 2016. Accessed on June 13, 2016, <http://indianexpress.com/article/india/india-news-india/primeminister-narendramodi-us-congress-speech-2842046/>, cited in Dr Rani D Mullen and Kashyap Arora, "Indian Development Cooperation with Afghanistan and the Afghan-India Friendship Dam", IDCR, Centre for Policy Research, June 16, 2016, [http://cprindia.org/sites/default/files/policy-briefs/Indian%20Development%20Cooperation%20with%20Afghanistan%20and%20the%20%E2%80%98Afghan-India%20Friendship%20Dam%E2%80%99\\_0.pdf](http://cprindia.org/sites/default/files/policy-briefs/Indian%20Development%20Cooperation%20with%20Afghanistan%20and%20the%20%E2%80%98Afghan-India%20Friendship%20Dam%E2%80%99_0.pdf)

36. See, Shakti Sinha, "Ghani's Afghanistan: Policy Options for India", *New Age Islam*, April 23, 2015, [newageislam.com/ghani-s-afghanistan-policy-options-for-india-/islam-and-politics-/d/102663](http://newageislam.com/ghani-s-afghanistan-policy-options-for-india-/islam-and-politics-/d/102663). Accessed on July 11, 2017.

37. Ibid.

# PLA REFORMS: POLITICAL AND STRATEGIC IMPLICATIONS

R K NARANG

## INTRODUCTION

In November 2012, Xi Jinping took over as the president of China, general secretary of the Communist Party of China (CPC) and chairman of the Central Military Commission (CMC). China was passing through a crucial phase when he came to power. High corruption within the Party, People's Liberation Army (PLA) and the government, slowing down of the economy<sup>1</sup> and waning popularity of the Party had increased his challenges.<sup>2</sup> The Party-PLA relationship had passed through some challenging times in the past, in which the role of the PLA in the Party politics had been a matter of concern for the Chinese leaders. Alleged coup attempts by Mshl Lin Biao to oust Mao in 1971 and later by Gen Yang Shangkun to remove Jiang Zemin indicated a history of the roller-coaster nature of the relationship between the PLA and the Party.<sup>3</sup> On the other hand, expansion of China's economic

---

Group Captain **R K Narang** is Senior Fellow at the Centre for Air Power Studies, New Delhi.

1. Robert Daly, "The Mixed Rationales and Mixed Results of Xi Jinping's Anticorruption Campaign", Wilson Centre, May 11, 2016, <https://www.wilsoncenter.org/article/the-mixed-rationales-and-mixed-results-xi-jinpings-anticorruption-campaign>. Accessed on September 30, 2017.
2. Yuxin Zhang, "Why Xi Jinping's Anti-Corruption Campaign Won't Legitimize the CCP", *The Diplomat*, August 12, 2014, v <http://thediplomat.com/2014/08/why-xi-jinpings-anti-corruption-campaign-wont-legitimize-the-ccp/>. Accessed on September 30, 2017.
3. "Three Chinese Leaders: Mao Zedong", Zhhttp://afe.easia.columbia.edu/special/china\_1950\_leaders.htm. Accessed on August 9, 2017.

**Xi initiated two major reforms, which impacted the PLA; these were the anti-corruption drive and the restructuring of the PLA. He launched the anti-corruption campaign in 2012, and restructuring of the military in 2016.**

and diplomatic engagements at the global level had raised its aspirations and the need was felt for reorganising the armed forces to protect its interests beyond mainland China.

Xi proclaimed the “Chinese Dream” in November 2012, which envisaged reclaiming national pride and achieving personal well-being through sustained economic growth. He called for an infusion of cultural values to balance materialism.<sup>4</sup> He was able to sell the idea of bringing honesty and propriety into public life,<sup>5</sup> and had created an environment for initiating

tough reforms. These reforms were going to affect the powerful people in the Party, the government and, especially, the PLA; therefore, building a supporting narrative was essential for its successful execution.<sup>6</sup>

Xi initiated two major reforms, which impacted the PLA; these were the anti-corruption drive and the restructuring of the PLA. He launched the anti-corruption campaign in 2012, which, on the face of it, was meant to bring accountability into public life among the government officials and PLA personnel. A number of PLA leaders were implicated under the anti-corruption campaigns, some of whom were confidants of former Party leaders. Some observers termed these initiatives as tools used by Xi to strengthen his hold on the Party by selectively targeting his opponents and their supporters.<sup>7</sup> The declaration of Xi as “The Core” of the CCP in February 2016 further strengthened his hold over the Party.<sup>8</sup>

---

4. “The Chinese Dream”, *The China Daily*, <http://www.chinadaily.com.cn/china/Chinese-dream.html>. Accessed on May 12, 2017.

5. Ben Westcott, “How Xi Jinping Became one of Modern China’s Most Powerful Leaders”, *CNN*, April 06, 2017, <http://edition.cnn.com/2017/04/06/asia/xi-jinping-profile/index.html>. Accessed on September 30, 2017.

6. Tomoki Kamo, “Interpreting Xi’s ‘Chinese Dream’”, February 18, 2014, <http://www.tokyofoundation.org/en/articles/2014/interpreting-xis-dream>. Accessed on August 10, 2017.

7. Cary Huang, “Xi Jinping’s Ambitious Power Play”, *South China Sea Morning Post*, February 11, 2016, <http://www.scmp.com/news/china/policies-politics/article/1911987/xi-jinping-s-ambitious-power-play>. Accessed on August 30, 2017.

8. Daly, n.1.

The second reform came through the formation of Theatre Commands in 2016, and was also viewed as a political move to reduce the influence of the PLA within the Party, placing people of Xi's choice in the PLA, strengthening of political control (over the PLA) as well as establishing structures to undertake expeditionary operations in pursuit of China's expanding economic and security interests. These were interconnected events, in which the interplay of various factors would have to be studied to understand the motive, necessity and likely impact of the PLA reforms. This paper argues that political considerations comprised a key driving force behind the reforms in the PLA. It examines the underlying currents behind the anti-corruption drive, the formation of the Theatre Commands and the possible implications of the two.

**A large number of senior PLA leaders had been arrested on corruption charges by March 2016, including Xu Caihou in 2014, and Guo Boxiong in 2015, both former vice chairmen of the CMC, 50 senior military officers of the rank of major general and above, and 16 lower level military officers.**

#### **ANTI-CORRUPTION DRIVE**

Corruption was rampant in China when Xi took over as president. The PLA was one of the main targets of the anti-corruption drive, which was launched in November 2012.<sup>9</sup> He reaffirmed his commitment to fight corruption during the meeting of the CPC disciplinary watchdog—the Central Commission for Discipline Inspection (CCDI)—in January 2013. He vowed to fight the “tigers” and “flies”, the two terms used to indicate powerful leaders and lowly bureaucrats respectively.<sup>10</sup> Several government officials, including some Communist Party officials, were indicted on corruption charges.<sup>11</sup> A large number of senior PLA leaders had been arrested on corruption

---

9. John Chan, “China’s Leadership, Announces the New Anti-Corruption Campaign,” November 27, 2012, <https://www.wsws.org/en/articles/2012/11/chin-n27.html>. Accessed on May 15, 2017.

10. “Xi Jinping Vows Unwavering Fight Against Corruption,” *Xinhuanet*, January 22, 2013, [http://news.xinhuanet.com/english/china/2013-01/22/c\\_132119843.htm](http://news.xinhuanet.com/english/china/2013-01/22/c_132119843.htm). Accessed on May 15, 2017.

11. Daly, n.1.

charges by March 2016, including Xu Caihou in 2014, and Guo Boxiong in 2015, both former vice chairmen of the CMC, 50 senior military officers of the rank of major general and above, and 16 lower level military officers. The charges of corruption included taking bribes for managing promotions, awarding contracts, and embezzlement of logistic stores and funds.<sup>12</sup> The number of PLA personnel punished for indiscipline rose to 4,885 by the end of 2016.<sup>13</sup> Gen Du Jicai, former secretary general of the Discipline Inspection Commission, was removed due to corruption charges and replaced by Lt Gen Zhang Shengmin in March 2017.<sup>14</sup>

A conflict of interest between the old and current leaders of the CPC on Party matters had been witnessed on some occasions in the past. Some old leaders continued to have a say within the Party even after their retirement. They were being seen as a counter-balance to the over-centralisation of authority by Xi.<sup>15</sup> *The Diplomat*, in an article in July 2015 brought out the close association of Xu Caihou and Guo Boxiong with former President Jiang Zemin. It reported that the removal of these two influential generals could be linked to Xi's efforts towards reducing the influence of Jiang Zemin within the Party.<sup>16</sup> The trials of these generals had not been made public, citing security reasons, which raised doubts on the true intent, and impartiality. Reuters, in an article, observed that the level of corruption had not reduced drastically despite the massive projection of the anti-corruption drive.<sup>17</sup> The Hudson Institute of Kleptocracy also made a similar observation by highlighting the

12. Dan Levin, "China Names 14 Generals Suspected of Corruption," March 02, 2015, [https://www.nytimes.com/2015/03/03/world/china-names-14-generals-suspected-of-corruption.html?\\_r=0](https://www.nytimes.com/2015/03/03/world/china-names-14-generals-suspected-of-corruption.html?_r=0). Accessed on May 21, 2017.
13. "Watchdogs Punish Corruption in PLA," *China Daily*, March 28, 2017, [http://www.chinadaily.com.cn/china/2017-03/28/content\\_28700819.htm](http://www.chinadaily.com.cn/china/2017-03/28/content_28700819.htm). Accessed on May 15, 2017.
14. Minnie Chan, "Xi Jinping Appoints a New Man to Tackle PLA Corruption," March 02, 2017, <http://www.scmp.com/news/china/diplomacy-defence/article/2075243/china-replaces-top-general-charge-tackling-military>. Accessed on May 21, 2017.
15. "Old Guards Still Calling the Shots in Beijing," April 04, 2017, *Nikkei Asian Review*, <https://asia.nikkei.com/Features/Xi-s-Supremacy/Old-guard-still-calling-the-shots-in-Beijing>. Accessed on August 09, 2017.
16. Bo Zhiyue, "Guo Boxiong, Jiang Zemin, and the Corruption of the Chinese Military," July 31, 2015, <http://thediplomat.com/2015/07/guo-boxiong-jiang-zemin-and-the-corruption-of-the-chinese-military/>. Accessed on May 21, 2017.
17. Benjamin Kang Lim and Megha Rajagopalan, "China's Xi Purging Corrupt Officials to Put Own Men in Place," *Reuters*, April 17, 2014, <http://www.reuters.com/article/us-china-corruption-xi-insight-idUSBREA3F1UT20140417>. Accessed on May 15, 2017.

prevailing scepticism about the impact of the anti-corruption drive, which it viewed as symbolic, questioning the inability of the drive to address deep-rooted issues of lack of transparency, promoting the rule of law and bringing in institutional reforms.<sup>18</sup> Robert Daly of the Wilson Centre, a policy research institute, observed that Xi, through his anti-corruption drive, was able to kill two birds with one stone, i.e. he cracked the whip on corrupt officials while, at the same time, used this as a pretext to systematically replace officials having connections with the former leaders, Jiang and Hu.<sup>19</sup> The power consolidation by Xi seems complete with the Party having accepted him as the leader for the period of his life.

### **STRENGTHENING POLITICAL CONTROL OVER PLA**

President Xi had faced challenges from the PLA after taking over as the General Secretary of the CPC and Chairman of the CMC in 2012. PLA troops had infiltrated in Daulat Beg Oldi area of India, in May 2013<sup>20</sup> and thereafter, in Chumar area during the visit of President Xi to India in September 2014. Chinese leaders and Foreign Ministry officials<sup>21</sup> expressing ignorance about the PLA's intrusion during Xi's visit to India,<sup>22</sup> indicated there were some undercurrents in the PLA-Party relationship.<sup>23</sup> These incidents took place against the backdrop of initiation of tough measures and the sacking of several PLA leaders. There is a possibility that some of these incidents could have been initiated at the behest of

---

18. "Xi's Anti-Corruption Campaign: Revolutionary Reform or Paper Tiger?," Kleptocracy Initiative, December 1, 2016, <http://kleptocracyinitiative.org/2016/12/revolutionary-reform-or-paper-tiger/>. Accessed on May 15, 2017.

19. Daly, n.1.

20. "Was the Chinese Intrusion Really a PLA Strike Against Xi Jinping?," May 13, 2013, <http://www.rediff.com/news/report/column-was-the-chinese-intrusion-in-ladakh-a-pla-strike-against-xi/20130513.htm>. Accessed on May 11, 2017.

21. Ruman Dahiya, "Border Standoff: Understanding the Motive", Institute of Defence Studies and Analysis, September 29, 2014, [http://www.idsa.in/idsacomments/BorerStandoff\\_rdahiya\\_290914](http://www.idsa.in/idsacomments/BorerStandoff_rdahiya_290914). Accessed on August 10, 2017.

22. "Is PLA Sending a Message to Xi Through Repeated Incursions into India: Analysts," September 18, 2014, [http://www.business-standard.com/article/news-ani/is-pla-sending-a-message-to-xi-through-repeated-incursions-into-india-analysts-114091800452\\_1.html](http://www.business-standard.com/article/news-ani/is-pla-sending-a-message-to-xi-through-repeated-incursions-into-india-analysts-114091800452_1.html). Accessed on August 10, 2017.

23. Gordon G. Chang, "The Real Threat from China's Military: Going Rouge", *The National Interest*, September 26, 2014, <http://nationalinterest.org/feature/the-real-threat-chinas-military-going-rogue-11356>. Accessed on August 10, 2017.



**President Xi had taken measures to reduce the influence of the PLA within the Party as well as strengthen political control over the PLA. The Chinese leadership was in overdrive mode to ensure that the Party discipline and supremacy of the CPC over the armed forces were ingrained into the PLA cadres so that the PLA reforms could progress smoothly.**

PLA leaders, who wanted to show their opposition to the policies and decisions taken by the Party leadership.

President Xi had taken measures to reduce the influence of the PLA within the Party as well as strengthen political control over the PLA. The Chinese leadership was in overdrive mode to ensure that the Party discipline and supremacy of the CPC over the armed forces were ingrained into the PLA cadres so that the PLA reforms could progress smoothly. Xi utilised his visits to PLA units and interactions with PLA leaders to reassert this aspect.<sup>24</sup> The Chinese

military website report of January 11, 2016, quoting Xi, urged military leaders to adhere to the Party spirit and political discipline.<sup>25</sup> In another article on January 12, 2016, Xi emphasised that leaders from various departments of the CMC should follow the Party's rules and discipline, and set an example for members of the armed forces.<sup>26</sup> He had stated the following in February 2016:

The armed forces should maintain a high degree of conformity with the CPC Central Committee and CMC, strictly obey political discipline and rule, and carry out their orders and instructions to the letter.<sup>27</sup>

- 
24. Yao Jianing, "Xi Underscores Military Building via Reforms," *Xinhua*, January 07, 2016, [http://eng.chinamil.com.cn/view/2016-01/07/content\\_7160342.htm](http://eng.chinamil.com.cn/view/2016-01/07/content_7160342.htm). Accessed on May 20, 2017.
  25. Dong Zhaohui, "China Reshuffles Military Headquarters," *China Military*, January 11, 2016, [http://eng.chinamil.com.cn/view/2016-01/11/content\\_7160591.htm](http://eng.chinamil.com.cn/view/2016-01/11/content_7160591.htm). Accessed on May 19, 2017.
  26. Zhang Tao, "Xi Urge Leaders of the CMC Organs to Respect Party's Discipline," *Xinhua*, January 12, 2016, [http://eng.chinamil.com.cn/view/2016-01/12/content\\_7160592.htm](http://eng.chinamil.com.cn/view/2016-01/12/content_7160592.htm). Accessed on May 20, 2017.
  27. Li Gang, "China's Military Regrouped into Five PLA Theatre Commands," February 01, 2016, [http://news.xinhuanet.com/english/2016-02/01/c\\_135065429.htm](http://news.xinhuanet.com/english/2016-02/01/c_135065429.htm). Accessed on May 11, 2017.

The above statement indicated the concerns of President Xi as well as his expectations from the PLA. However, he continued to face challenges from within the Party as well as from some PLA leaders after initiating the anti-corruption drive and restructuring of the PLA team. This necessitated some changes in the higher level leadership of the PLA as well as the continuation of the perception management campaign during his entire first term as president. Xi reminded the PLA of absolute loyalty to the Party while speaking to 84 newly established corps level army institutions in April 2017<sup>28</sup> and later during the 90th anniversary parade of the PLA at the Zhurihe Combined Tactics Training Base at Inner Mongolia on August 1, 2017. Mail Online, in an article, on August 4, 2017, observed that the change of venue of the seminar on “Unifying the Understanding Among Party Members” in Beijing from the Party school to the Jing Xi hotel run by the PLA, and the aggressive posturing during the confrontation with India in Doklam could also be linked to the internal power struggle.<sup>29</sup> The standoff between Indian and Chinese troops in the Doklam area, which started in June 2017, continued to be on the boil till a compromise was reached in August 2017.<sup>30</sup> The hostile stance taken by the PLA over Doklam was initially viewed as

**The standoff between Indian and Chinese troops in the Doklam area, which started in June 2017, continued to be on the boil till a compromise was reached in August 2017. The hostile stance taken by the PLA over Doklam was initially viewed as China’s reaction to India’s refusal to join the One Belt One Road (OBOR) and its increasing bonhomie with the US and Japan.**

---

28. Yao Jianing, “Xi Stressed Party’s Absolute Authority of Army”, *China Military*, April 19, 2017, [http://eng.chinamil.com.cn/view/2017-04/19/content\\_7567596.htm](http://eng.chinamil.com.cn/view/2017-04/19/content_7567596.htm). Accessed on May 20, 2017.

29. Claude Apri, “How Can Xi Speak of a ‘Chinese Dream’ and a ‘Peaceful Rise’ While Threatening Those Who Dare Oppose China?,” *Mail Online India*, August 05, 2017, <http://www.dailymail.co.uk/indiahome/indianews/article-4762370/Can-Xi-speak-Chinese-Dream-Peaceful-Rise.html>. Accessed on August 06, 2017.

30. A disputed territory between Bhutan and China, located at the tri-junction of India-China-Bhutan border and a change in status quo in this area could have given strategic advantage to China and was not acceptable to India.

China's reaction to India's refusal to join the One Belt One Road (OBOR) and its increasing bonhomie with the US and Japan.<sup>31</sup> Some analysts even suggested that Xi might have wanted to keep the Doklam standoff<sup>32</sup> simmering in order to keep the dissidents away.<sup>33</sup> However, the deal for resolution of the Doklam standoff was reached only after the removal of the Gen Fang Fenghui, chairman, joint chiefs of staff, PLA. He was replaced by Gen Li Zuocheng in a swift move, in the last week of August 2017.<sup>34</sup> He was viewed as a hurdle to the resolution of the Doklam standoff, which was imposing huge diplomatic and economic costs on China's interests and having a negative impact on its high profile OBOR initiative.<sup>35</sup>

The series of events indicated that Xi was concerned about the high influence wielded by the PLA in the Party and used deft manoeuvring to subtly reduce it through organisational reforms. The delegates of the PLA, financial institutions, and elected representatives of the provinces together form the 2,300 strong National Congress of the Party.<sup>36</sup> These 2,300 delegates (from 40 blocks) were to elect replacements of 200 out of 376 members of the Central Committee (CC), 5 out of 7 Politburo Standing Committee members and 11 out of 25 Politburo members in the 19th Party Congress<sup>37</sup> in October 2017.<sup>38</sup> The PLA delegates, being the members of the provincial committees

---

31. Siddique Wahid, "Beyond Doklam: Why China Offered to Mediate in the Kashmir Dispute," July 21, 2017, <https://scroll.in/article/844394/beyond-doklam-why-china-offered-to-mediate-in-the-kashmir-dispute>. Accessed on July 28, 2017.

32. n.30.

33. P Stobdan, "Doklam: China's Anxieties and Domestic Dissidents May Have a Role," July 29, 2017, <https://www.thequint.com/opinion/2017/07/29/xi-jinping-domestic-dissidents-and-doklam-standoff>. Accessed on August 09, 2017.

34. Yi Yang, "Restructure, Then Purge: How Sheriff Xi's PLA Clean-Up Works," September 02, 2017, <http://www.atimes.com/article/restructure-purge-sheriff-xis-pla-clean-works/>. Accessed on September 06, 2017.

35. Brahma Chellaney, "Doklam Issue: China's Xi Jinping has a PLA Problem," *Hindustan Times*, September 05, 2017, <http://www.hindustantimes.com/analysis/doklam-issue-china-s-xi-jinping-has-a-pla-problem/story-bEqRc9linyioqwKJGUP0aO.html>. Accessed on September 06, 2017.

36. Stephen Fallon, "The 19th National Congress of China's Communist Party," *Parliament of Australia*, [http://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/pubs/BriefingBook45p/ChinaCongress](http://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/BriefingBook45p/ChinaCongress). Accessed on August 08, 2017.

37. The Party Congress takes place every five years

38. Jayadeve Ranade, "The 19th Congress of the Chinese Communist Party," May 18, 2017, <http://www.vifindia.org/article/2017/may/18/the-19th-congress-of-the-chinese-communist-party>. Accessed on August 08, 2017.

and Central Party Congress, play a significant role in Party politics and in deciding the outcome of the Party Congress. Therefore, it was important for Xi to have PLA representatives of his choice in the National Party Congress to ensure the election of his candidates in the crucial Party posts in the 19th Party Congress.

The representation of the PLA in Provincial Party Standing Committees was also reduced by replacing them with political representatives. The feasibility of reducing the representation of the PLA in the 20th Party Congress (scheduled to be held in 2022) by citing PLA restructuring and reduction of seven Military Regions (MRs) into five Theatre Commands was also being explored.<sup>39</sup> These initiatives were seen as endeavours to consolidate Xi's position in the Party and to carry forward his agenda in his second and final tenure as the president.<sup>40</sup>

### **THEATRE COMMANDS**

The process to restructure the PLA was set in motion at the plenary session of the 18th Party Congress in November 2013. Thereafter, a group was established under the CMC to draw up a roadmap in April 2014. The restructuring of the PLA was announced during the parade to commemorate the 70th anniversary of World War II on September 3, 2015.<sup>41</sup> It was implemented with the reorganisation of the seven MRs of the PLA, i.e. Beijing, Jinan, Nanjing, Guangzhou, Chengdu, and Lanzhou into five Theatre Commands (TCs) namely, Eastern, Southern, Western, Northern and Central Theatre Commands on February 1, 2016.<sup>42</sup>

The formation of Theatre Commands was aimed at enhancing their combat effectiveness for meeting China's regional aspirations while, at the same time, using it as an opportunity to reduce the influence of the PLA

---

39. Ibid.

40. "How Chinese Leaders Are Elected to Party Congress," *Xinhua*, October 02, 2017, <http://www.globaltimes.cn/content/1068981.shtml>. Accessed on October 02, 2017.

41. Zhao Lei, "PLA Restructures to Meet New Challenges," *Chinadaily*, January 11, 2017, [http://usa.chinadaily.com.cn/epaper/2017-01/11/content\\_27927214.htm](http://usa.chinadaily.com.cn/epaper/2017-01/11/content_27927214.htm). Accessed on August 16, 2017.

42. Gang, n.27.

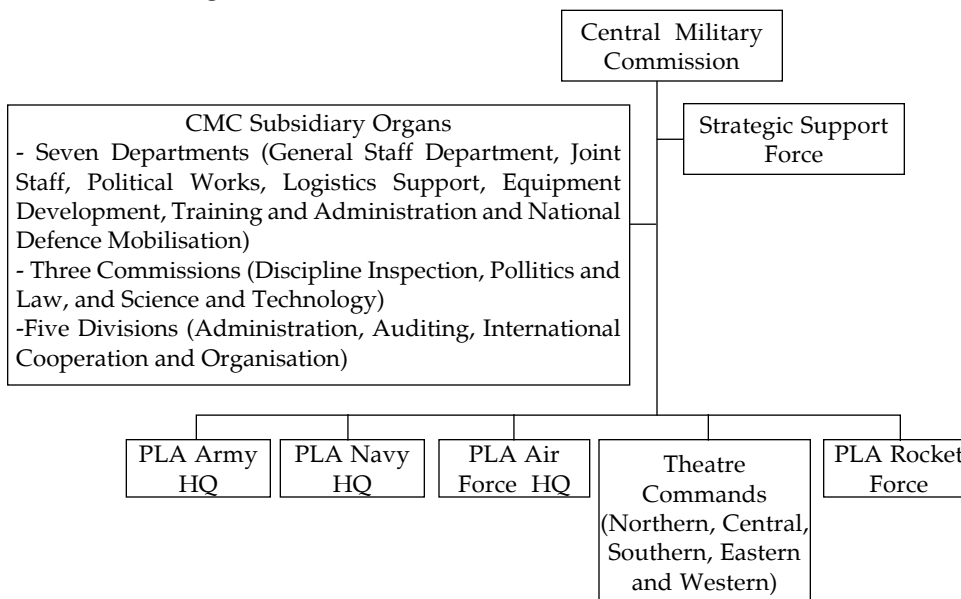
in Party matters. The restructuring of the PLA into Theatre Commands needed redistribution of manpower, equipment and readjustments in infrastructure, etc. and its impact would be known in due course. The PLA's Second Artillery was renamed as the PLA Rocket Force (PLARF); it has become the fourth Service and is at par with the Army, Navy and Air Force. The PLARF will have both nuclear and conventional missiles, which would provide it with a veil to camouflage its deployment of strategic nuclear missiles along with conventional missiles. Also, a PLA Strategic Support Force (PLASSF) was created to provide cyber, and intelligence support to all the four Services as well as undertake space operations.<sup>43</sup>

The new structure has 15 new subsidiary organs under the CMC, as shown in Fig 1. The new subsidiary organs include the Department of Joint Staff and Commission of Science and Technology. The joint staff, as the name suggests, will coordinate functions related to joint planning and operations. The inclusion of Science and Technology (S&T) as a subsidiary organ of the CMC indicates the significance China attaches to its role in future warfare. Incidentally, defence forces and Science and Technology were two of the four modernisations undertaken by Deng Xiaoping in 1978.<sup>44</sup> The integration of resources as per Theatre Commands would improve synergy; however, it will also create new challenges, which need to be studied.

---

43. Maj Gen BK Sharma et al., "Analysis of China's Military Reorganisation," Occasional Paper 2-2016, *USI*, <http://usiofindia.org/publications/OccasionalPapers/ChinasMilitaryReorganisation.pdf>. Accessed on May 19, 2017.

44. "We Can Develop a Market Economy Under Socialism," *People's Daily*, November 26, 1979, <http://en.people.cn/dengxp/vol2/text/b1370.html>. Accessed on May 21, 2017.

**Fig 1: New Structure of the Chinese Armed Forces<sup>45</sup>**

China had earlier announced a reduction of 300,000 troops on the occasion of the commemoration of the 70th anniversary of the China-Japan War in September 2015, with the intention to make the PLA lean, mean and responsive.<sup>46</sup> The size of the Chinese Army was to be reduced from 2.3 million to 2 million, phasing out outdated equipment and reducing the size of the militia.<sup>47</sup> This was followed by the reduction in the army reserves during the session of the National People's Congress in March 2017.<sup>48</sup> The focus of the reduction in manpower had been to reduce the physical strength of the Chinese Army and enhance the strength of the other Services to prepare for

45. Zhang Tao, "China's New Central Military Commission Organ Established," *China Military*, January 11, 2016, [http://english.chinamil.com.cn/news-channels/china-military-news/2016-01/11/content\\_6852723.htm](http://english.chinamil.com.cn/news-channels/china-military-news/2016-01/11/content_6852723.htm). Accessed on May 24, 2017.

46. "Xinhua Insight: China Announces Troop Cut Ahead of its First War Victory Parade," September 03, 2015, [http://news.xinhuanet.com/english/2015-09/03/c\\_134586909.htm](http://news.xinhuanet.com/english/2015-09/03/c_134586909.htm). Accessed on May 12, 2017.

47. Dong Zhaohui, "China Releases Guidelines on Military Reform," *Xinhua*, January 01, 2016, [http://english.chinamil.com.cn/news-channels/china-military-news/2016-01/01/content\\_6840068.htm](http://english.chinamil.com.cn/news-channels/china-military-news/2016-01/01/content_6840068.htm). Accessed on May 20, 2017.

48. Yao Jianing, "China to Reduce Army Reserves as Part of Military Reform," *China Military*, March 10, 2017, [http://eng.chinamil.com.cn/view/2017-03/10/content\\_7521737.htm](http://eng.chinamil.com.cn/view/2017-03/10/content_7521737.htm). Accessed on May 20, 2017.

**The strengthening of the Chinese defence industry and its enhanced capability to produce a variety of land, air and naval weapons in large numbers were critical enabling factors for the formation of Theatre Commands.**

a technology-intensive war as well as for out of area contingencies.

#### **IMPLICATIONS**

The operational factors responsible for the establishment of Theatre Commands need to be deliberated upon from the point of view of the necessity, availability and integration of resources, and the impact on operations. The strengthening of the Chinese defence industry and its enhanced capability to produce a variety of land, air and naval weapons in large numbers were critical enabling factors for the formation of Theatre Commands. However, Theatre Commands are likely to be independent and self-sufficient entities; therefore, they would need separate army, air force and naval components and dedicated resources. This would greatly increase the requirement of resources.

The formation of Theatre Commands would have an impact on the operational capability of the PLA. China has territorial/ border disputes with India, countries in Southeast Asia, the East China Sea and South China Sea. It has established a military base in Djibouti and has economic interests all over the globe, which would need to be protected. Chinese Theatre Command forces may be required to operate in island territories as well as protect their interests away from their homeland. The reorganisation of geographical areas under Theatre Commands would integrate land, naval and air force assets and enhance their capability to undertake joint operations. However, distribution of high technology defence equipment according to geographical limits could adversely impact their operational employability and effectiveness.

Command-wise distribution of meagre resources, especially high-value strategic resources like air power assets, could adversely impact their flexibility and effectiveness in an actual war. Their division according to geographical boundaries could limit the flexibility available to the

commander. Air assets can operate at the tactical, operational and strategic levels at the same time. They have the ability to undertake intra-theatre and inter-theatre operations. Therefore, distribution of high value and meagre air assets could result in sub-optimum exploitation of their unique capabilities.

#### *Expeditionary Capabilities*

The operational necessity of Theatre Commands can be viewed from two key angles: firstly, for achieving synergy among the armed forces; and, secondly,

for undertaking joint operations in out of area contingencies. It is the latter which appears to be the predominant influence on the decision to establish Theatre Commands. China's White Paper on National Security, 2015 highlighted the need for protecting its "overseas interests concerning energy and resources, strategic Sea Lines of Communication (SLOCs), as well as institutions, personnel and assets abroad." The White Paper indicated China's aspiration for developing expeditionary military capabilities,<sup>49</sup>

The reorganisation of the command structure and formation of Theatre Commands is in line with the Chinese aspiration for developing military capabilities to undertake military operations beyond mainland China. The indigenous development of Y-20 aircraft, strategic bombers, large seaplanes, High Altitude Long Endurance (HALE) combat aircraft, Unmanned Aerial Vehicles (UAVs), aircraft carriers, etc. are steps in the strengthening of air and naval forces and for achieving the expeditionary capability.

**The operational necessity of Theatre Commands can be viewed from two key angles: firstly, for achieving synergy among the armed forces; and, secondly, for undertaking joint operations in out of area contingencies. It is the latter which appears to be the predominant influence on the decision to establish Theatre Commands.**

---

49. Full text: "China's Military Strategy," May 26, 2015, [http://www.chinadaily.com.cn/china/2015-05/26/content\\_20820628.htm](http://www.chinadaily.com.cn/china/2015-05/26/content_20820628.htm). Accessed on August 15, 2017.



### *Other Challenges*

The reorganisation of the PLA, despite some operational benefits, would bring in new challenges. The formation of Integrated Commands has created two separate command chains, i.e. to Theatre Commands for undertaking operations, and to Services Headquarters for building the armed forces through equipping and training. The delineation of responsibilities to separate organisations for operations and organisation building could also have an adverse impact on the development of the complementary capabilities of a fighting force. Separating the three key aspects of war-fighting, i.e. acquisition, training and operations, may lead to a gap between preparation and war-time execution.

In a reorganised structure of the PLA, operational flexibility and effectiveness could become a casualty in the conduct of air operations from the geographically restricted Theatre Commands. The chiefs of the three PLA Services have been relieved of the responsibility of exercising control over the Operational Commands, and theatre commanders are placed directly under the CMC. The new Theatre Command joint structure, headed by a single Service commander could impact the efficiency and effectiveness of the technology-intensive air and naval operations within the theatre as well as for undertaking trans-theatre operations, which may become a limitation in a dynamic war scenario.

A study by the European Council of Foreign Relations observes that restructuring could adversely impact the operational preparedness of the PLA as the new commanders and political commissioners would come from the ground forces and raise doubts about the effectiveness of the air and naval forces in such arrangement.<sup>50</sup>

### *India-China Scenario*

The Chinese armed forces in the past were organised in the traditional way in which the respective Service Headquarters (HQ) had operational control over air, land and naval forces. However, the formation of Theatre

---

50. Cristina Garafola, "Will the PLA Reforms Succeed?", *European Council of Foreign Relations*, [http://www.ecfr.eu/page/-/XIS\\_ARMY\\_-\\_GARAFOLA.pdf](http://www.ecfr.eu/page/-/XIS_ARMY_-_GARAFOLA.pdf). Accessed on May 20, 2017.

Commands has altered the dynamics of warfare, which is likely to have an impact on any future India-China conflict. The reorganisation would result in certain operational benefits but also the emergence of new vulnerabilities for the PLA. Also, the circumstances and necessity for reorganisation by one country may not apply to another country. Therefore, the circumstances and necessity for the formation of Theatre Commands by China, along with associated advantages and disadvantages, would need to be studied carefully to prevent drawing the wrong lessons.

The employment philosophies of the three Services vary, depending upon their unique capabilities, geographical area and availability of resources. An India-China War scenario is likely to focus on the borders located in the north and northeast of India. India has a relatively smaller army and a less developed transportation network, while the Chinese Army is bigger and its territory adjoining India has a better transportation network connectivity, which gives it an advantage. However, the relative disadvantage for India in the past was balanced by the Indian Air Force (IAF), which was equipped with more capable combat aircraft and had well-trained and professional air force personnel. The IAF enjoyed a qualitative and quantitative edge over the PLA Air Force (PLAAF) on the India-China border area; therefore, a balance was maintained between the armed forces of the two countries.

After the reorganisation of the PLA in January 2016, the newly formed Western Theatre Command covers the entire border with India, which was earlier covered by two MRs. This would enhance synergy among various PLA ground formations against India as well as between the PLA and PLAAF forces, which will improve their ability to undertake joint operations against India. As of now, the IAF still has an advantage over the PLAAF and would be able to field a greater number and more capable, combat aircraft against the Chinese Western Theatre Command. The availability of low elevation airfields and highly trained pilots provides an edge over the PLAAF. The combined capability of the IAF and Indian Army would be able to match the Chinese threat. However, the quality and number of air assets being the inducted by the PLAAF are improving, and India would need to keep a close watch on the induction of advanced defence equipment, developments in

**China has territorial disputes with Taiwan, Philippines, Malaysia, Vietnam and Brunei. It has developed airfields, naval bases, positioned PLA troops, aircraft, radars and air defence units, etc. on the disputed island territories in the East and South China Seas.**

the Chinese defence industry, organisational changes, and China's aspirations for regional hegemony, to prepare for future challenges.

*East and South China Seas*

According to *Time* magazine, the Nationalist government of China, in 1947, etched out an eleven-dash line to indicate the Chinese claim on island territories in the South China Sea. This was later reduced to a nine-dash line to hand over the Gulf of Tonkin to Vietnam in 1952. The "nine-dash line" was a visionary narrative from the Chinese perspective, which appeared to have been built to support Chinese aspirations for a leadership position and establishing control over disputed island territories in the long run. China's focus on building military bases in island territories located in the South China Sea gained momentum after it submitted a map to the United Nations in 2009 with the nine-dash line.<sup>51</sup> The China-Japan dispute over the Senkaku Islands, China's setting up of an Air Defence Identification Zone (ADIZ), and patrolling of disputed territory by Chinese drones in the recent past have made the situation volatile between the two countries.<sup>52</sup>

China has territorial disputes with Taiwan, Philippines, Malaysia, Vietnam and Brunei. It has developed airfields, naval bases, positioned PLA troops, aircraft, radars and air defence units, etc. on the disputed island territories in the East and South China Seas. The rising capability of its defence industry and strengthening of its armed forces have enabled it to deploy land, air and naval assets in such territories to assert its claims as well

---

51. Hannah Beech, "Just Where Exactly Did China Get the South China Sea Nine-Dash Line From?," *Time*, July 19, 2016, <http://time.com/4412191/nine-dash-line-9-south-china-sea/>. Accessed on May 18, 2017.

52. Yoko Wakatsuki and Junko Ogura, "Japan: China 'Escalating' Tensions Over Disputed Islands," May 19, 2017, <http://edition.cnn.com/2017/05/19/asia/japan-china-disputed-islands-jets-drone/index.html>. Accessed on August 15, 2017.

as carry out surveillance with its medium and long-range manned and unmanned aerial vehicles to deter adversaries. Its endeavour has been to keep territorial disputes within manageable limits while aggressively building bases along the coastline and developing island territories.<sup>53</sup> It is buying time till it can develop the capability to support its regional ambitions. The newly formed Theatre Commands and rising naval and air capability will enable it to undertake joint operations to protect disputed territories in the East and South China Seas as well as take on the combined military of the Japan-US over the disputed island territory if such a situation arises.

**The Chinese military has not been involved in military operations in the recent past and the formation of Theatre Commands did not appear to have originated from the lessons learnt from recent operations undertaken by the Chinese military or from global conflicts. Strengthening of political control over the PLA was given the highest priority by President Xi.**

## CONCLUSION

Chinese President Xi Jinping's political moves involving the declaration of the "China Dream" and launching of the anti-corruption campaign – especially aimed at high-ranking officers of the PLA – are significant events, which have had a stimulating effect on the reorganisation of the PLA. The timing of the PLA intrusion into Indian territory in 2013 during President Xi's visit to India in 2014 and the standoff at Doklam in 2017, had symptoms of undercurrents between the PLA leadership and the CPC led by President Xi.

The formation of Theatre Commands appears to be a political decision to strengthen the political control over the PLA. Xi's approach in establishing control over the PLA is being compared to the one followed by Chairman Mao in the 1960s and 1970s. Xi and Mao followed different paths to assert

---

53. "New PLA Airforce Base Boosts Capabilities", May 28, 2012, <http://www.taipeitimes.com/News/taiwan/archives/2012/05/28/2003533924>. Accessed on April 3, 2016.

their authority and exercise control over the PLA. Mao had removed his Defence Minister Pen Dehuai in 1959 and thereafter, Pen's successor Lin Bao was removed in 1971 to ensure that Mao retained control over the PLA. However, President Xi, unlike Chairman Mao, has taken direct control of the PLA by establishing five Theatre Commands and placing them directly under the CMC, thereby removing the PLA HQ from the chain of command.<sup>54</sup>

The Chinese military has not been involved in military operations in the recent past and the formation of Theatre Commands did not appear to have originated from the lessons learnt from recent operations undertaken by the Chinese military or from global conflicts. Strengthening of political control over the PLA was given the highest priority by President Xi. The reforms in the PLA met the strategic aspirations as well as provided Xi with an opportunity to reduce the powers of the PLA and replace some of the senior PLA leaders loyal to previous incumbents with those loyal to him.

The formation of the ADIZ in the East China Sea in 2013,<sup>55</sup> construction of the military base in Djibouti, Gwadar port in Pakistan and Hambantota port in Sri Lanka, with potential for military usage, construction of aircraft carriers, infrastructure development and positioning of its armed forces in the islands located in the South China Sea all indicate China's regional and global aspirations. This factor played a significant role in the formation of Theatre Commands. The Chinese Defence Ministry spokesman Yang Yujun's statement after the establishment of the Theatre Commands in February 2016, "(The five Theatre Commands)..... will better safeguard national sovereignty, security and interests while upholding regional stability and world peace," indicates the regional and global aspirations of China.<sup>56</sup>

The impact of the reorganisation of the PLA and formation of Theatre Commands would be known once the integration is complete in all respects

---

54. "Why Xi is Purging the Chinese Military", *The National Interest*, April 15, 2016, <http://nationalinterest.org/feature/why-xi-purging-the-chinese-military-15795>. Accessed on May 15, 2017.

55. Ben Blanchard and David Brunnstrom, "China Says US Should Respect China's Air Defence Zone", *Reuters*, March 23, 2017, <http://www.reuters.com/article/us-china-usa-defence-idUSKBN16U0SB>. Accessed on May 18, 2017.

56. Gang, n. 27.

and the three Services, i.e. the PLA, PLAN and PLAAF have gained adequate experience of training together under the Theatre Commands, and China fights a war successfully. However, in the absence of these conditions, an analysis of the employment of the military in the present scenario can be carried out on the basis of the attributes of military power and the experience gained from its employment in past wars to understand the strengths and vulnerabilities of the Theatre Commands.

The functions and operational philosophy of the army, air force and navy differ due to their unique capabilities and the resources held by them. Army units are self-sufficient in most respects and their operational areas have a relatively less geographical span when compared to the navy and air force. The navy operates away from land into the sea and has a little conflict of interests with the army and, hence, does not have a major adverse effect due to the formation of the Theatre Commands. The operational employment philosophy of air forces, on the other hand, is quite different from that of the army and placing air force elements under geographical limits could adversely impact its flexibility and operational effectiveness. Therefore, Theatre Commands might result in sub-optimal utilisation of their unique capabilities and adversely impact the overall operational effectiveness of the PLA.

The chronology of events indicates that the political consideration was one of the key reasons behind the reforms in the PLA. The formation of Theatre Commands will improve synergy among, army, navy and air force, and help them undertake operations beyond mainland China. However, the Theatre Command structure may hinder the optimum exploitation of the unique capabilities of the respective Services and have an adverse impact on the overall operational effectiveness of the PLA.

# AIR POWER IN HYBRID WAR

MANMOHAN BAHADUR

## INTRODUCTION

The evolution of war and conflict has been in step with the progress of mankind and civilisation. What probably started as simple differences, when two or more humans started cohabiting, and conflicts between and amongst clans, transformed over time to war as one now knows it – long, bloody and with killings that have progressed to being based on a myriad reasons, and sometimes on issues that are baffling to a sane observer. Thus, from territorial disputes to issues of ideology, and from economic dissonance to religious disagreements, conflict has mutated further with the introduction of new elements that have brought about a change in the way conflicts pan out. Technology has been one of the elements that has been instrumental in these changes and has been a big disrupter down the ages. Though human nature and intrigue were always part of the discourse on war, the globalisation of thought and information flow brought about by Information and Communication Technology (ICT) has become a game changer, as the end game of warfare has moved from capturing territory directly to sometimes being content with ‘capturing’ it through influencing human minds. The participants too have changed from state actors to non-state ones, as also now a mix of the two, controlled by a central authority managing the conflict. The results have been manifest in what has come to be termed as hybrid warfare.

---

**Air Vice Marshal Manmohan Bahadur VM (Retd)** is Distinguished Fellow at the Centre for Air Power Studies, New Delhi.

**As technology enhanced the capability of nations to dominate others, either economically and/or militarily, the power asymmetry that developed between them increased and brought in the use of non-state actors by states themselves.**

Wars were land-centric in the early part of human civilisation till the advent of naval power altered the equations; nations with strong navies set out on colonisation expeditions to benefit from unexplored and untapped areas of the planet but, in the bargain, changed the way wars were fought. However, a more disruptive change occurred when man took to the skies in a heavier-than-air machine and air power demonstrated that he who ruled the air above the land and water could dictate the outcome of wars. As technology enhanced the capability of nations to dominate others, either economically and/or militarily, the power asymmetry that developed between them increased and brought in the use of non-state actors by states themselves—their use would be discussed in detail later. This essay would discuss, in four sections, how air power comes into play in hybrid war. First, there would be a resume of what is hybrid war, followed by an analysis of how air power gets involved in the melange that constitutes this type of conflict. This would then lead to a case study of Israel’s engagement in Lebanon in 2006, which is a classic example of how a hybrid war should not be fought, and how Israel learned, and successfully implemented, the lessons in the next engagement in Gaza in 2009. Since technology enables all parties in a conflict, how advancements in ICT have enabled both air power and the non-state actors would be discussed next, before a summation closes this essay.

## **BACKGROUND**

The term hybrid war was introduced in an article in 2005 in the US Navy’s *Proceedings Magazine*, written by Lt Gen James Mattis (then commandant of the US Marine Corps)<sup>1</sup> and Lt Col Frank Hoffman, also of the Marine Corps. The authors, elaborating on the types of war that America was likely

---

1. Lt Gen James Mattis is now the US secretary of defence.



to face, wrote, “We do not face a range of four separate challengers as much as the combination of novel approaches – a merger of different modes of war. This unprecedented synthesis is what we call hybrid war.”<sup>2</sup> Frank Hoffman, in another work, called it a “blend of the lethality of state conflict with the fanatical and protracted fervour of irregular war.”<sup>3</sup> Yet another work deems it as being part of “pervasive warfare” as against being an element of a military operation,<sup>4</sup> implying that hybrid warfare would be a long ongoing process in the life of a nation; in continuation, another study puts it as “hybrid adversaries test the strategic patience of their opponents.”<sup>5</sup>

**Is hybrid war actually a 21st century phenomenon or is it that the political and military scholarship of the past century has neglected to analyse earlier wars and campaigns as being undertaken by both regulars and irregulars – acting alone or in consonance, depending on the necessity of the conflict?**

But, is hybrid war actually a 21st century phenomenon or is it that the political and military scholarship of the past century has neglected to analyse earlier wars and campaigns as being undertaken by both regulars and irregulars – acting alone or in consonance, depending on the necessity of the conflict? The latter appears to be the case, as a detailed study of nine wars ranging from Germania (AD 9-16) to Vietnam conducted by two academics

- 
2. Lt Gen James N Mattis and Lt Col Frank Hoffman, “Future Wars: The Role of Hybrid Wars,” *Proceedings Magazine*, vol 132/11/1,233, November 2005 issue, available at <https://www.usni.org/magazines/proceedings/2005-11/future-warfare-rise-hybrid-wars>. Accessed on November 27, 2017.
  3. Frank G. Hoffman, *Conflict in the 21st Century: The Rise of Hybrid Wars* (Arlington, VA: Potomac Institute for Policy Studies, 2007), p. 28, available at [http://www.potomacinstitute.org/images/stories/publications/potomac\\_hybridwar\\_0108.pdf](http://www.potomacinstitute.org/images/stories/publications/potomac_hybridwar_0108.pdf). Accessed on February 7, 2018; Frank G Hoffman, “Hybrid Warfare and Challenges,” *Joint Forces Quarterly*, Issue 52, 1st quarter 2009, available at <http://smallwarsjournal.com/documents/jfqhoffman.pdf>. Accessed on November 25, 2017.
  4. Kenneth C Coons, Jr and Glenn M Harned, “Irregular Warfare is Warfare,” *Joint Forces Quarterly* issue 52, 1st quarter 2009, available at <http://www.dtic.mil/dtic/tr/fulltext/u2/a515615.pdf>. Accessed on February 7, 2018.
  5. Peter R Mansoor, “Hybrid Warfare in History,” in Williamson Murray and Peter R Mansoor, eds., *Hybrid Warfare: Fighting Complex Opponents from the Ancient World to the Present* (Cambridge University Press, 2012), p. 7.

of the Ohio State University shows.<sup>6</sup> Even as ‘regulars’ and ‘irregulars’ were involved since long, it has only been in the past century and a half that these terms have acquired a legal definition. A ‘regular’ armed force was defined by the Third Geneva Convention of 1949, which itself is based on the definition of ‘belligerents’ as laid out in The Hague Conventions of 1899 and 1907. It is interesting to note that these and many more such conventions/agreements are based on the Lieber Code of 1863;<sup>7</sup> the Lieber Code is named after Francis Lieber, a Columbia Law School professor, who was tasked with drafting rules for combatants and conduct of warfare in the American Civil War. The Lieber Code lays down the definition of a belligerent, and those not qualifying for this definition as being non-combatants; thus, Lieber says, “So soon as a man is armed by a sovereign and takes the soldier’s oath of fidelity, he is a belligerent.”<sup>8</sup> ‘Sovereign’ signifies a state in the present context and, hence, an organised group of ‘belligerents’ would constitute a regular armed force of a state; any other grouping would constitute an ‘irregular force.’ To be called a regular force, the following conditions are mandated by The Hague Convention of 1899<sup>9</sup>:

- To be commanded by a person responsible for his subordinates.
- To have a fixed distinctive emblem recognisable at a distance.
- To carry arms openly.
- To conduct operations in accordance with the laws and customs of war.

The Annexe to The Hague Convention 1899 further clarifies, “In countries where militia or volunteer corps constitute the army, or form part of it, they are included under the denomination ‘army.’” It is, thus, important to understand how regulars and irregulars are used in the four types of wars that take place.

---

6. Ibid.

7. Patryk I Labuda, “Lieber Code,” available at <http://opil.ouplaw.com/view/10.1093/law:epil/9780199231690/law-9780199231690-e2126>. Accessed on November 14, 2017.

8. Ibid.

9. The Hague Convention 1899, Annex Section 1, Chapter 1, Article 1 available at [http://avalon.law.yale.edu/19th\\_century/hague02.asp](http://avalon.law.yale.edu/19th_century/hague02.asp) and [http://avalon.law.yale.edu/19th\\_century/hague02.asp#art1](http://avalon.law.yale.edu/19th_century/hague02.asp#art1). Both accessed on December 26, 2017.

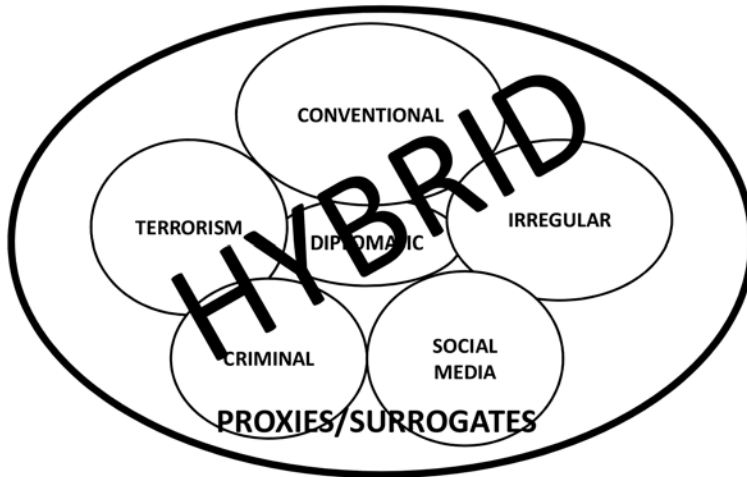
- In conventional wars, only states and their regular forces are involved.
- Irregular wars comprise insurgency and/or guerrilla warfare; these involve only irregulars or the term commonly used now, non-state actors.
- A compound war is a combination of conventional and irregular conflict in which war is planned and executed through strategic planning and direction; *the execution, though, is decentralised.*
- In a hybrid war, there is both strategic direction and strategic control on state and non-state actors. There is a synthesis of regulars and irregulars in this type of war, where both types of actors act as per a common plan, with each having a specific role to enact; the progress is assessed centrally and revised tasks are issued, which again get monitored and modified as the war progresses. There is a common storyline or plot, as in the Indo-China conflict in the 1950s where the Vietminh had a narrative of throwing out the French whereas the colonial French had none; the propped-up Emperor Bao Dai was seen as a French puppet by the locals, and despised.<sup>10</sup> The effect of the proliferating communication media, at that time, just the radio, was slowly being felt in the transmission of the 'big picture' in which the state actors and irregulars were involved.

The communication media has evolved exponentially since then, both in its range of transmission and the large variety that is available to nearly everyone. With the advent of computers and computing technology, and with technology enabling the doubling of computing power every eighteen months, the landscape of hybrid war has changed. More arenas have been added to both conventional and irregular wars, bringing hybrid war into play; this is depicted below in Fig 1 that shows hybrid war spanning at least six fields of activity wherein the principals may be advancing their own agendas through proxies and surrogates.

---

10. Mansoor n. 5, p. 8.

Fig 1



While public media in the form of print and television has been active for many decades, it has been the advent of Social Media (SM) in the past 20 years that has changed equations in many ways, leading to an all encompassing term, 'Information War' representing a new addition to the hybrid war menu. Information war, in simple terms, comprises starting a new narrative or injecting into an ongoing narrative, information, misinformation or disinformation so as to influence and/or shape opinions, attitudes and the subsequent behaviour and actions of a population. Thus, besides the use of the print and electronic media that constitute Main Stream Media (MSM), the actors (both state and non-state) are using media like What's App, Facebook, Instagram and the like to influence human thought. Since the reach of SM is instantaneously worldwide, it has become the key instrument for belligerents on both sides of the divide for use in propaganda and shaping opinions.

There is one aspect of SM that has not garnered enough discussion, and that is its contribution towards enhancing 'cumulative deterrence' in the peace, or quasi-peace that prevails before the outbreak of kinetic hostilities. The Israelis have been using this very effectively in their,

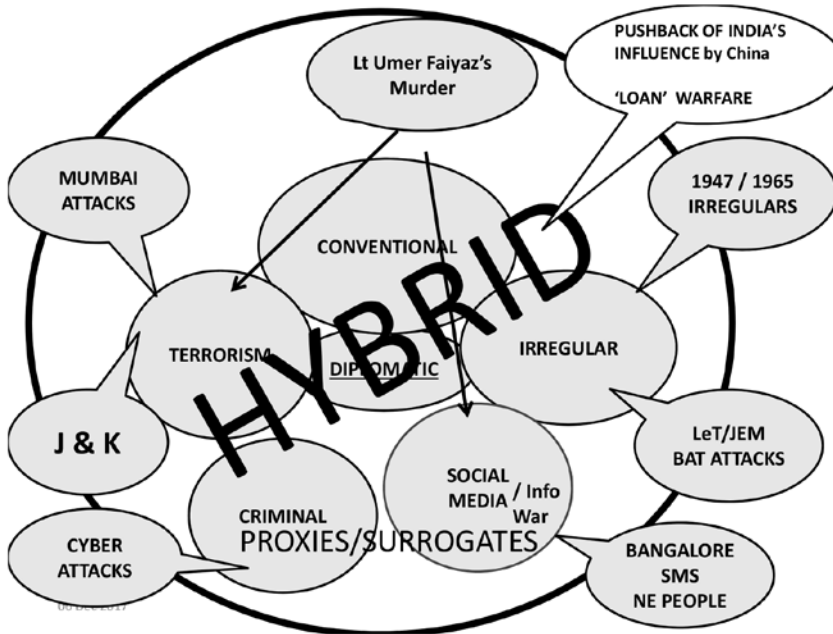
almost continuous, engagement with hostile neighbours and non-state actors.<sup>11</sup> In a 2012 engagement, a spokesman of the Israeli Defence Force (IDF) tweeted, “We recommend that no Hamas operatives, whether low level or senior leaders, show their faces above ground in the days ahead.” They also posted data on air strikes and rocket launches and attempted to shape world opinion by putting “infographics” on the internet purporting to show how Hamas uses Palestinian homes as military command centres.<sup>12</sup> The other side (non-state actor) too has not been quiet and the Izz a-Din al-Qassam Brigade tweeted in response, “Our blessed hands will reach your leaders and soldiers wherever they are (you opened hell gates on yourselves).”<sup>13</sup> Has this succeeded? One Israeli military writer claims that it has, and quotes that there have been cases of people not giving girls for marriage to Hamas fighters due the short life they are expected to have because of Israeli surveillance and kinetic action.<sup>14</sup>

Thus, the milieu that presents itself, with some examples of what the Indian security establishment is facing, is painted in the following graphic (Fig 2).

**‘Information War’ represents a new addition to the hybrid war menu. Information war, in simple terms, comprises starting a new narrative or injecting into an ongoing narrative, information, misinformation or disinformation so as to influence and/or shape opinions, attitudes and the subsequent behaviour and actions of a population.**

- 
11. For more on the Israeli concept of cumulative deterrence, see Manmohan Bahadur, “Israel’s Concept of Cumulative Deterrence: Will it bring Peace to the Region?” *Air Power Journal*, vol 8, no.4, Winter 2013 (Oct-Dec), pp. 107 -126. Also available at <http://capsindia.org/files/documents/APJ-vol-8-no-4-Oct-Dec-2013.pdf>
  12. “Israel vs Hamas on Twitter too,” Associated Press report of November 16, 2012, available at <https://www.ndtv.com/world-news/israel-vs-hamas-on-twitter-too-504724>. Accessed on November 26, 2017.
  13. Ibid.
  14. Dorong Almog, “Cumulative Deterrence and the War on Terrorism,” *Parameters*, Winter 2004-05, pp. 4-9, available at <https://pdfs.semanticscholar.org/e5a3/ee38a1b3f25339925997d3294c688a2e3a64.pdf>

Fig 2



The above layout does not mean that there has to be ongoing conflict in all the arenas concurrently for it to be classified as a hybrid war. In fact, more often than not, the conventional part is generally missing, and the protagonists engage in other aspects that get constituted as ‘small’ wars. Small wars are *not* smaller versions of conventional wars; small wars last long and have their own unique characteristics that need to be addressed, especially by air power—these will be covered later in this paper. But it would be prudent at this stage to first summarise the key characteristics of hybrid war before proceeding further.

Hybrid war is a Janus<sup>15</sup>-faced threat that encompasses the doctrinal tenets of both conventional and unconventional (irregular) war in which the centre of gravity tends to be nebulous. It is conceptually distinct in that it envisions a *low tempo* but, nevertheless, *lethal action* at *different points* along the spectrum of conflict, *all at the same time*. The Russians use deception,

15. Janus was a Roman God who, the legend goes, could look both ways. For more on Janus, see <https://www.britannica.com/topic/Janus-Roman-god>. Accessed on February 3, 2018.

which they call *Maskirovka*, based on the idea that the main battle space is the human mind.<sup>16</sup> They understand it as a new generation war that would be driven by information and psychological war and feel that it is a must to attain superiority in troops and weapons control, as well as to morally and psychologically depress the enemy's armed forces personnel and civil population; the Russians' actions in the annexation of Crimea in 2014 and their involvement in the Ukrainian crisis since 2013 testify to their adherence to their belief in, and usage of, *Maskirovka*. The Chinese too are adept at this kind of 'people's war.' Two colonels of the People's Liberation Army (PLA), Cols Liang and Xiangsui, wrote a far-reaching paper in 1990 titled "Unrestricted Warfare."<sup>17</sup> The colonels wrote that the first rule of unrestricted warfare is that there are no rules, and nothing is forbidden in conflict. The arenas of warfare include trade, finance, ecology, psychology, smuggling, media, drug related activities, network, technology, manufacturing, natural resources, economic aid, cultural engagement *and* international law. This brings out clearly that the aim in hybrid war is interfering with, or manipulating, civic and military life, in short all aspects of an adversary's society. Thus, the response required to counter a hybrid war imposed on a nation has to be, what else but hybrid itself – nothing short of an all encompassing effort and seamless integration on the part of different agencies of the targeted country will suffice! And air power forms one part of that all out effort.

The four basic 'arms' of the government that constitute the anti-hybrid warfare force are the civil administration and land, sea and air forces.

- **Civil Administration:** The hybrid actor, through its irregulars and through irregular activity (like mis/disinformation through the media, spreading disaffection in society *et al*), attempts to target elements of daily life like general law and order, food, water, shelter, medical and health, justice dispensation and the economy of its target nation; as can be discerned, these are all non-kinetic actions that are to be addressed by the state.

---

16. For more on *Maskirovka*, see [www.dtic.mil/get-tr-doc/pdf?AD=AD1022096](http://www.dtic.mil/get-tr-doc/pdf?AD=AD1022096). Accessed on February 7, 2018.

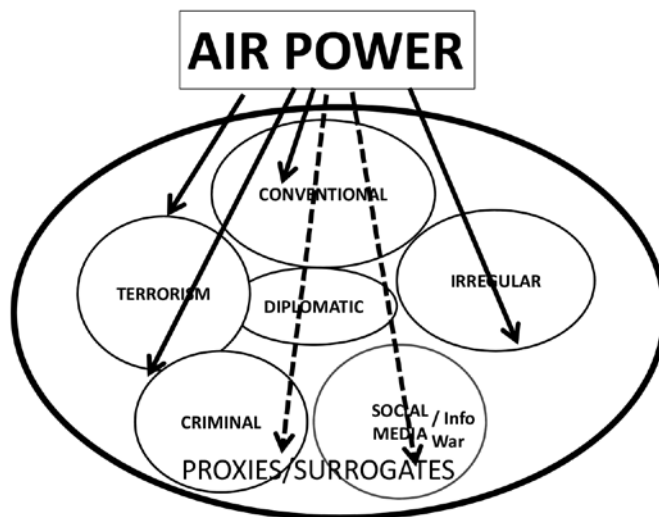
17. David Barno and Nora Bensahel, "A New Generation of Unrestricted Warfare," in *War on the Rocks*, Available at <https://warontherocks.com/2016/04/a-new-generation-of-unrestricted-warfare/>. Accessed on February 7, 2018.

- **Land Forces:** The land power of a nation has the advantage of being present amongst the people and comes into the assistance role (including for maintaining law and order) when requested by the civil administration. However, on its own, it gets activated for the anti-hybrid war strategy in conventional war and anti-insurgency tasks.
- **Maritime Forces:** The maritime forces have a limited presence amongst the people due their shore basing, but have an important role in offshore surveillance that is part of coastal security. This was brought home to India in a grievous way during the Mumbai terrorist attacks on November 26, 2008.
- **Air Power:** The air power of a nation is not present amongst the populace but is directly involved in providing critical assistance to the other three arms while they discharge their respective tasks; in some cases, it is called upon to discharge its strike functions too.

### AIR POWER EMPLOYMENT

Air power is an integral part of the counter-hybrid force that is required to fight hybrid war. Using the earlier graphics, it gets involved in two forms: directly and in an associated manner (see Fig 3).

Fig 3





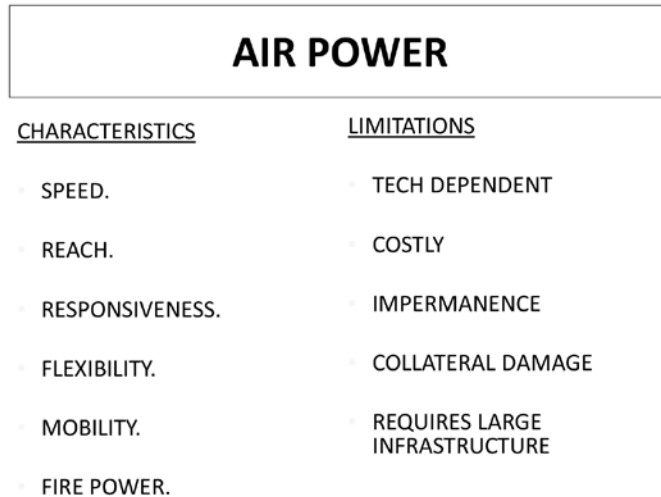
The continuous lines show where air power is directly involved, viz., in conventional conflict, terrorism and irregular war while the dotted lines show its involvement in a supportive role. That leaves out the diplomatic drive – but it is here that the diplomatic prowess and astuteness of a nation's Foreign Service community leverages the 'authority' of the air power of the nation (and other elements of national power) to influence events. This can only happen if there is a coherent national strategy, and air power users know how, when and where they come into the equation at the field level.

What happens in the field is that during the period when there are no hostilities, the irregular force aids the regular forces by provisioning supplies, tactical information, easing passage and augmenting subversive personnel; in a way, during peace-time, they prepare the battlefield for the regulars, if and when the latter are called in to action. In parallel, during peace-time, the regular forces are tasked by the government of the day to aid the irregulars through provisioning of training, funds, strategic intelligence, equipment, safe havens and the eradication of people who are not loyal to their cause, or 'collaborators,' as they term them. Hence, a counter-hybrid war strategy has to be *strategic in conception* to simultaneously deal with the following issues:

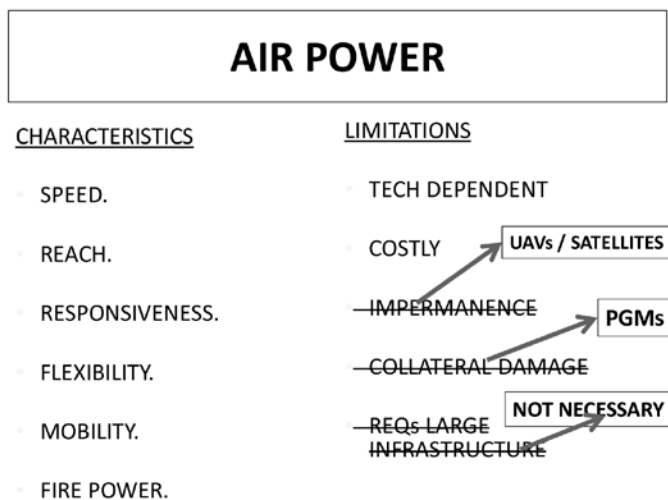
- To counter criminality;
- To counter terrorism and insurgency;
- To diplomatically isolate the 'cause' of the entity that has inflicted the hybrid war on one's country; all the while
- **Retaining** and improving the capability to fight a conventional war; loss or depletion of this aptitude can be disastrous, as would be soon seen in the case study that follows.

To plan and operationalise all the above mentioned aspects through the prism of an anti-hybrid war role would require detailed planning and an assessment of the sustenance ability of the nation; this is necessary since, as brought out earlier, hybrid war is spread over the complete spectrum of conflict and the government would have to discharge the anti-hybrid war role for a long duration of time. This would necessitate a 'whole of government approach' where no agency is left out at any point on the time line. Here,

the use of air power needs to be done judiciously, keeping its characteristics and limitations in mind.



The above figure is well understood and needs no elaboration. However, technical innovations have reduced a few limitations, some partially and some in a substantial manner.



Collateral damage, that was associated with the high destructive power of air armaments, has been reduced substantially through the enhanced availability of precision munitions; though the danger of non-combatants being hit still exists, the new generation of low yield armaments has ameliorated this problem to some extent. However, it is the reduction in the impermanence of air power that has played a big role in its enhanced contribution in anti-hybrid war operations. Unmanned Aerial Vehicles (UAVs) and satellites have now brought the element of 'stare' to the list of capabilities of air power, especially with respect to UAVs. With increasing numbers of satellites, and progress being made towards launch on demand in the coming decades, satellites too would come into this category. How these aspects come into play becomes clearer as the utilisation of air power in all aspects of anti-hybrid war is analysed.

#### **SUPPORT BY AIR POWER**

Air power provides Intelligence, Surveillance and Reconnaissance (ISR) and mobility, and assists in ensuring Command and Control (C2) besides its basic task of bringing to bear fire power through focussed strikes. The importance of ISR collection requirements in the hybrid warfare scenarios is driven by one fundamental fact which is, that when the population is the centre of gravity, "intelligence is king...(and) if insurgents lose in the minds of the people, they lose, period."<sup>18</sup> Thus, provisioning to the civil administration of satellite and UAV imagery to preempt disaffection due to issues of food and water security, moving equipment and material to provide shelter and succour in natural calamities, and quick mobilisation and moves of the security forces in case of a civil disturbance, help the civil administration in maintaining social security – aspects that a hybrid actor aims to disturb. Accurate parachute drops of food and other essentials to outlying villages in northeast India that are difficult to reach by road has been, and continues to be, an important task for the Indian Air Force. This

---

18. Colin S. Gray, *Irregular Enemies and the Essence of Strategy: Can the American Way of War Adapt?*, Strategic Studies Institute (US Army War College, Carlisle, Pa., March 2006), p. 20, available at [http://ptbrown.net/Small%20Wars/Gray\\_Irregular%20Enemies%20and%20adapting%20way%20of%20war.pdf](http://ptbrown.net/Small%20Wars/Gray_Irregular%20Enemies%20and%20adapting%20way%20of%20war.pdf). Accessed on February 6, 2018.

**Air power is intricately involved in the conduct of elections in India's insurgency prone areas like in Jammu and Kashmir (J&K) and the Naxalite hit states in central India through the transportation of election material and staff to inaccessible areas.**

not only provides for the physical comforts of the locals but also adds to the emotional connect with the national administration: "the nation has not forgotten us and will look after us," is the message that goes across to the villagers and prevents any dissatisfaction from developing that the irregulars can work to their advantage.

Air power is intricately involved in the conduct of elections in India's insurgency prone areas like in Jammu and Kashmir (J&K) and the Naxalite hit states in central India through the transportation of election material and staff to inaccessible areas. Similarly, in the inaccessible areas of the northern hills (due lack of roads and/or due to natural causes like being snow-bound), the carriage of ballot boxes and the staff of the Election Commission of India is done with the aim of ensuring 'inclusion' of the population who may otherwise get a feeling of being alienated from the governing of the nation, and may get swayed by insurgent propaganda.

In some cases, air power can also be tasked to use force within a nation's borders to prevent a law and order situation from becoming a threat to its unity; Pakistan is a prime example in its kinetic strikes in its western and northwestern border regions during the past decade or so. Israel also is a prime example of proactive use of air power to fight a hybrid war; it would be instructive to study how its air power has been effective or found wanting in its recent conflicts in a hybrid war milieu. This would be done through two case studies; the first would be of the 2006 Lebanon War, and the second being Operation Cast Lead conducted by Tel Aviv in 2009 in the Gaza Strip.

#### **LEBANON, 2006**

After studying the trends in warfare from the mid-1980s, and especially considering the advent of precision munitions and their effective employment in the Gulf Wars, Serbia and Kosovo, the Israeli security establishment had come to the conclusion that future conflicts with its detractors would be

in the form of Low Intensity Conflict (LIC). That would comprise engagements with insurgents waging guerrilla warfare so that they do not directly confront the very superior Israeli conventional forces. They surmised that the conflict would be long drawn and the best way of tackling it would be through precision strikes by standoff artillery and air power, which Israel had in abundance. They trained and equipped for that; funds too were accordingly allotted.<sup>19</sup> In the event,<sup>20</sup> the standoff strikes did not force Hezbollah to meet the Israeli demands and when the ground forces were sent in, they could not manoeuvre well, as they had lost the art due to the doctrinal change that had come about. As a RAND study put it, "...Unfortunately for Israel, as operations in Lebanon in 2006 would show, the Israeli Army's almost exclusive focus on LIC resulted in a military that was largely incapable of joint combined arms fire and manoeuvre."<sup>21</sup>

**In some cases, air power can also be tasked to use force within a nation's borders to prevent a law and order situation from becoming a threat to its unity; Pakistan is a prime example in its kinetic strikes in its western and northwestern border regions during the past decade or so.**

The Hezbollah, too, had studied the changing trends in technology and the prowess that the Israeli armed forces possessed. Accordingly, they trained to counter the superior conventional fire power with a mixture of conventional war-fighting and guerrilla tactics. The Hezbollah forces were disciplined and trained to operate in cohesive small units.<sup>22</sup> They acquired standoff weapon capability and used anti-tank guided missiles, mortars, and rockets. They even had the C-802 Iranian made anti-ship cruise missiles which they used

---

19. Mohammad Naved Ferdaus Iqbal, "The Second Lebanon War: Failures, Lessons Learned and the Future," available at <http://smallwarsjournal.com/jrnl/art/the-second-lebanon-war-failures-lessons-learned-and-the-future>. Accessed on February 8, 2018.

20. The 2006 Second Lebanon War started on July 12, 2006. It has generated many studies on how and why the IDF, and Israel as a state, failed in its mission.

21. David E Johnson, "Military Capabilities for Hybrid Warfare: Insights from the Israel Defense Forces in Lebanon and Gaza," RAND Paper, available at [https://www.rand.org/content/dam/rand/pubs/occasional\\_papers/2010/RAND\\_OP285.pdf](https://www.rand.org/content/dam/rand/pubs/occasional_papers/2010/RAND_OP285.pdf). Accessed on November 22, 2017.

22. Ibid.

to target and damage an Israeli Navy's ship in the Mediterranean.<sup>23</sup> A greater surprise element was the use of the Mohajir UAVs to gather intelligence on Israeli deployments. The Hezbollah foot soldier lived and operated from within the civil populated areas, while the leadership was safely entrenched in underground concealed bunkers. This was classic hybrid warfare that was waged by a conventionally weak force that stood no chance against a technologically state-of-the-art military machine, but which had not planned to fight the opponent with a counter hybrid strategy.

Defeating the Hezbollah required disrupting and cutting off its supplies and communications routes by interdiction; this required ground forces that could manoeuvre and bring the adversary out into the open from its hidden locations. But, as brought out earlier, the Israeli Defence Force (IDF) had been budgeted, equipped and trained to fight a projected LIC scenario and had lost the art of manoeuvre.<sup>24</sup> Standoff air power was used extensively but it came up short as its limitations were exposed against concealed targets due to the following reasons:

- The Hezbollah leadership hid in bunkers.
- Direct escalation to kill the Hezbollah leadership was not permitted due to the adverse fallout that would be generated worldwide.
- The previous covert tracking of individuals done during peace-time, thus, came to nought and could not be used for decapitating the core.
- The air campaign against long range rockets was militarily successful but the one against small 'Katyusha' rockets was a failure.
- 13,000 Katyusha rockets were placed close to Israel's border in tunnels, houses and dense vegetation.
  - Even when the launch plume of a rocket became visible, an attack was often not feasible due to the risk of collateral damage.
  - Katyushas continued to strike north Israel over the three-week conflict.

---

23. Ramit Plushinick-Masti, "Israel: Iran Aided Hezbollah Ship Attack," Associated Press report, July 15, 2006 <http://www.washingtonpost.com/wp-dyn/content/article/2006/07/15/AR2006071500189.html> The report states that Iran denied any involvement, but the fact is that a cruise missile damaged an Israeli Navy ship in which one Israeli died and three went missing.

24. Johnson, n. 21.

- Israel did try to minimise the civilian casualties by taking the following steps:
  - 165,000 telephone calls were made to the occupants of houses due to be struck, asking them to relocate.
  - Almost 2.5 million leaflets were dropped.

Hezbollah, however, comprehensively won the influence campaign and it became a political disaster for Israel,<sup>25</sup> with the IDF withdrawing from Lebanon in September 2006.

What went wrong? While the IDF, being the most professional user of air power, knew its characteristics and limitations well, it was the factor of casualty aversion that made the political and military leadership overreliant (and may be, overconfident) on its long distance precision strike capability. Forgotten was the reality that an irregular adversary, who is a major part of hybrid war, merges with the populace and uses his anonymity as a shield to defeat long range precision weaponry – in hybrid war, there is no getting away from a ‘physical’ interaction with the irregular in the latter’s home turf. Small or irregular wars are not smaller versions of conventional war but are long and intelligence intensive campaigns. Though high-tech aspects of air power, like smart bombs, space assets and UAVs come in handy in small wars, low-tech aspects of air power too are important; simple aircraft may be better, as evident from the decision of the US to provide slower moving Super Tucano propeller driven aircraft to the Afghan Air Force in their counter-insurgency operations.<sup>26</sup> The Israeli leadership was a quick learner from the Lebanon debacle and recast their budget, procurement and training priorities, the results of which were seen in the next ‘round,’ this time in Gaza in Operation Cast Lead that was launched in 2009.

---

25. Ibid.

26. Franz-Stefan Gady, “US Buys 6 more Light Attack Aircraft for Afghan Air Force,” *The Diplomat*, available at <https://thediplomat.com/2017/10/us-buys-6-more-light-attack-aircraft-for-afghan-air-force/>. Accessed on February 8, 2017.

**Small or irregular wars are not smaller versions of conventional war but are long and intelligence intensive campaigns. Though high-tech aspects of air power, like smart bombs, space assets and UAVs come in handy in small wars, low-tech aspects of air power too are important.**

**OPERATION CAST LEAD, 2009**

Gaza has a terrain that is sandy and flat, unlike the hilly one that helped the Hezbollah in Lebanon. The preparation comprised collection of accurate intelligence and meant that the Israelis knew the locations of rockets which were then attacked using Global Positioning System (GPS) munitions—most during the first night of the attacks. The rockets were treated as time sensitive targets with the ‘sensor to shooter’ time delay being very short; 20 percent of the rockets were destroyed

before they could be launched while the other 80 percent were neutralised very shortly after launch, in some cases as little as forty-five seconds later. The ‘Iron Dome’ anti-missile system was the key to neutralising the stream of rockets that were fired into Southern Israel.<sup>27</sup>

ISR was the *critical* enabler, with most of the work having been done *prior* to the conflict – in peace-time. UAVs provided the bulk of real time ISR and were used to assist the ground forces shadow evacuation missions, enable prosecution of time sensitive targets, and ensure target validation and adherence to rules of engagement. Re-supply, often to isolated pockets of Israeli forces was done by helicopters, which also inserted special and conventional forces. This brought to the fore the fact that air power provided flexibility and initiative, which are the hallmarks of irregular combat. All this while, a well trained and adept (unlike in Lebanon 2006) ground force was kept ready to move in; in the event this did not happen, its readiness was well publicised as part of the perception management to have the required effect. Thus, the IDF used technology to overcome its deficiencies

---

27. Zachary Goldman, “More than a Missile: Judging Iron Dome,” *War on the Rocks*, August 11, 2014, available at <https://warontherocks.com/2014/08/more-than-a-missile-judging-iron-dome/>. Accessed on February 7, 2018.



**ACTIONS TO NULLIFY ADVANTAGES OF AIR POWER**

As states and their forces have modernised, so have the non-state actors and states practising hybrid warfare by developing 'antidotes' to counter air power. Hybrid actors seek *not* to engage conventional air power symmetrically. Surface-to-Air Missiles (SAMs) have been brought into conflict zones, forcing air power assets to step up their operating altitudes. This was seen in North Vietnam where fixed SAM sites meant that control of the air was not absolute and introduction of the SA7 shoulder launched SAM in 1972 changed the equation till Electronic Counter Measures (ECM) had been generated. In Kosovo also, North Atlantic Treaty Organisation (NATO) aircraft largely remained above 15,000 ft,<sup>28</sup> where the Serbians used their radars fleetingly, negating the effectiveness of anti-radiation missiles. Similarly, the loss of a MiG-21 and Mi-17 helicopter in the initial stages of the Kargil conflict forced the Indian Air Force to innovate, step up and resort to using the GPS for bombing from high altitudes in addition to Precision Guided Munitions (PGMs).<sup>29</sup> In future, in the space arena, adversaries will seek to jam GPS signals as such jammers are easily available on the open market. Kinetic anti-satellite technologies would be with very few nations and, hence, the hybrid actor would like to use other, cheaper options to cripple a system.

As technology advances further, and proliferates too, the F-35 represents what an air power asset can do in the battle space. An F-35 can provide top cover for a ground convoy and, at the same time use, its Active Electronically Scanned Array (AESA) radar as an offensive cyber weapon. Simultaneously, it can use its advanced air-to-ground surveillance radar to track insurgents

**As states and their forces have modernised, so have the non-state actors and states practising hybrid warfare by developing 'antidotes' to counter air power. Hybrid actors seek *not* to engage conventional air power symmetrically.**

---

28. See RAND Paper, available at [https://www.rand.org/content/dam/rand/pubs/monograph\\_reports/MR1365/MR1365.ch3.pdf](https://www.rand.org/content/dam/rand/pubs/monograph_reports/MR1365/MR1365.ch3.pdf). Accessed February 8, 2018.

29. Benjamin S Lambeth, *Air Power at 18000': The Indian Air Force in the Kargil War* (Washington: Carnegie Endowment for International Peace, 2012), pp. 16 and 26.

moving on foot and detect an incoming cruise missile. Technological advancements will enable the hybrid actor to reduce the asymmetric advantage of air power by using even the more lethal Man-Portable Air Defence System (MANPADS) (in the physical domain) and the media and cyber offensive to its advantage.

### **AIR POWER AND PERCEPTION MANAGEMENT**

As discussed earlier, the media as a medium has become a vital tool in the hands of both sides. Its criticality arises from the fact that the principles of *Jus ad bellum* (ethics and laws regarding a nation's right to go to war) and *Jus in bello* (ethics and laws of waging war) have become vital factors in governing perceptions that get generated.<sup>30</sup> Warfare has become accountable and a military commander is now responsible, not only upward to his next higher official in the reporting chain and downward to his subordinates, but also *outward* to non-combatants or the civil population. It must be remembered that *precision weapons, if not used correctly, kill more precisely*. Thus, to avoid collateral damage and loss of goodwill amongst the civilian population, the destructive potential of air power has to be tempered with the 'outward factor.' It has to be accepted that the benign aspects of air power, like mobility, ISR, medevac and Search and Rescue (SAR) may sometimes be more useful in hybrid war where non-combatants can get caught in hostilities. Since hybrid war(fare) is a mix of social, political, economic and *may be* military issues, the desirable end state possible could perhaps just be a favourable state of peace.

### **SUMMATION**

Hybrid war is not new and has been practised for many centuries. It is a multi-faceted and multi-spectrum conflict that requires to be countered by a strategy that acknowledges this multi-arena existence and guides actions in

---

30. Major Mary T. Smith, "Air Power in Hybrid Warfare: Ethical Implications for the Joint Force Commander," *Journal of National Security Studies*, United States Naval War College, Fall 2014, available at [https://usnwc2.usnwc.edu/Publications/-Luce-nt-/Archives/2014/Special-Edition/Fall\\_2014\\_Full-Volume.aspx](https://usnwc2.usnwc.edu/Publications/-Luce-nt-/Archives/2014/Special-Edition/Fall_2014_Full-Volume.aspx) pp. 106 - 108.

them simultaneously. Since there is no silver bullet to tackle hybrid war, a multi-agency approach, which is actually a whole of government approach, is necessary. It would also be imperative to keep up with the march of technology as both state and non-state actors would use technological prowess to gain, and retain, the upper hand. Air power is technology intensive and, besides being an independent actor in counter-hybrid war operations, it is also a vital tool to support all other arms of the government in this generally long drawn out fight. India has been fighting a hybrid war in J&K and the Naxalite hit areas for decades now and even as this struggle is ongoing, its manifestation in the spectrum of irregular combat should not introduce a doctrinal change that brings down the traditional war-fighting capabilities of its armed forces *a la* the IDF at the beginning of this century. In hybrid war, all segments of the counter-hybrid war force must be adept at their tasks and discharge their functions as part of the strategic plan drawn up by the government; anything short would only extend the trauma of the populace and the nation.

# THE QUEST FOR SPACE CONTROL

**T H ANAND RAO**

*Control of space means control of the world.*

– Lyndon B Johnson

(President of the United States from 1963-69)

Space is one of the less explored dimensions of modern warfare. Dependence on space is increasingly becoming a necessity, as an enabler of enhanced military capabilities, as an alternative for building deterrence, and as a resource which can be exploited for societal and commercial benefit. There is also growing dependence of a nation's economy on space commerce and industry. While dependence on space for military applications has seen an exponential rise over the years following the Gulf War of 1991 (Operation Desert Storm), the asymmetry in space capabilities is distinct even today. A handful of space-faring nations are poised to take conflict into the final frontier: space. A resource which is vast and seems unlimited is being conquered at a pace beyond imagination.

About 1,800 active satellites orbit the Earth, providing worldwide communications, navigation, weather forecasting, remote sensing, imagery and space surveillance. For militaries, which rely on some of these satellites for modern warfare, space has become the ultimate high ground, with the US being the undisputed leader. With China now attempting to aggressively

---

Group Captain **T H Anand Rao** is Senior Fellow at the Centre for Air Power Studies, New Delhi.

**Low Earth Orbits (LEOs) and Geo-stationary Earth Orbits (GEOs) have become hotbeds of scientific and commercial activity, filled with hundreds of satellites from about 70 different nations. Despite their largely peaceful purposes, each and every satellite is at risk, because of the growing threat of anti-satellite weapons and a diminishing space legal regime.**

challenge US superiority in space with ambitious military space programmes, and Russia with similar capability as the US, the power struggle risks sparking a conflict that could cripple the entire planet's space-based infrastructure. And though it might begin in space, such a conflict could easily ignite a full-blown war on Earth. The emergence of new space powers like Japan, India, Brazil, Israel, Iran and Korea is bound to see new possibilities.

The situation is much more complicated as Low Earth Orbits (LEOs) and Geo-stationary Earth Orbits (GEOs)

have become hotbeds of scientific and commercial activity, filled with hundreds of satellites from about 70 different nations. Despite their largely peaceful purposes, each and every satellite is at risk, because of the growing threat of anti-satellite weapons and a diminishing space legal regime. To understand the criticality of the issue, it is necessary to see the growing reliance of mankind on space and its applications.

#### **APPLICATIONS OF SPACE-BASED ASSETS**

Satellites remain at the core of human exploitation of space, despite the many advances in space exploration. The impact of space technology can be felt in many aspects of our day-to-day life. Some of the benefits that have changed our lives include knowing exactly where we are on the planet using Global Positioning System (GPS) applications, weather forecasts, watching TV from remote locations, robotic surgeries, with doctors sitting at distant locations, mobile phone communications from anywhere in the world, networked banking systems, networked airline and railway ticketing, etc. Remotely sensed data reveals an unparalleled view of the Earth for systems that require periodic observation such as surveying, agriculture, mineralogy,

hydrography, geology, landmass cover, land utilisation and environment monitoring. The advancement of remote sensing has made remote sensed data more affordable and available, and finds applications in a variety of data sources.

There is a growing number of emerging space applications which have the potential to provide enormous opportunities for the benefit of mankind. Some of the emerging applications are listed below <sup>1</sup>:

- Global resource management (protection of terrestrial, coastal and marine resources).
- Oceanography.
- Oil spill detection.
- Innovative tele-health applications - satellite-based telemedicine networks.
- Innovative communications-satellite-based personal communications systems.
- Space-borne tsunami warning system.
- Disaster monitoring, mitigation and damage assessment.
- Drought risk reduction.
- Managing energy resources on the Earth.
- Convergence of the internet and space technology.
- Weather applications such as climate change studies and weather conditioning to weaken hurricanes, tornadoes, etc.
- Remote sensing for precise farming and mining operations, response to emergencies, traffic management, etc.
- Surveillance capabilities from space for domestic border surveillance, precise fire monitoring from space, marine/wildlife resource management, and better data for mapping, etc.

**Remotely sensed data reveals an unparalleled view of the Earth for systems that require periodic observation such as surveying, agriculture, mineralogy, hydrography, geology, landmass cover, land utilisation and environment monitoring.**

---

1. Phillip Olla, "Space Technologies for the Benefit of Human Society and Earth", at <https://link.springer.com/content/pdf/bfm%3A978-1-4020-9573-3%2F1.pdf>. Accessed on November 1, 2017.

- Enabling services such as earthquake detection and warning.
- Energy generation in space and sunlight reflection to the Earth.
- A new satellite-based air traffic control system known as the Automatic Dependent Surveillance Broadcast (ADS-B).
- Weather satellite system called the National Polar Orbiting Environmental Satellite System (NPOESS).

Looking even farther into the future, possible applications of space can be envisioned to provide additional revolutionary capabilities such as<sup>2</sup>:

- Production of unique products in orbital factories.
- Planetary defence.
- Space tourism.
- Orbital and lunar resorts.
- Helping to meet the Earth's energy needs.
- Commercial lunar and asteroidal resource exploitation.

Space applications support both private and government users of space services. These applications attract billions of dollars of business for industries that provide communication systems, mobile telephones and data, direct-to-home TV, satellite radio, wideband data services, remote sensing (including mapping, agriculture, resource management, land use, etc.), and positioning, navigation, and timing services based on the GPS and similar satellite constellations. The satellite industry, space launch, tracking and monitoring services comprise another segment which is attracting investments and is now a thriving industry. Government users will exploit space for military and other national security-related purposes, as well as a number of well-known civil government functions. The important point is that new and innovative space applications are developing faster than ever before. The future holds exciting prospects for space capabilities to improve life on Earth.

---

2. Stan Rosen, "Future Space Applications Promise Revolutionary Improvements in our Quality of Life", at <http://www.nss.org/adastra/HowSpaceCanImproveLifeOnEarth.pdf>. Accessed on November 1, 2017.

## SPACE COMMERCE

Space commerce broadly involves the construction of satellites and their ground control stations, launch of satellites, sale of space systems components, sale and leasing of satellite services, commercial remote sensing and weather forecasting, navigation by GPS satellites, the design and deployment of space laboratories for scientific research and product development, mineral exploration and mining on celestial bodies, space tourism, etc. The space industry and commerce already comprise the new space race that is in the nascent stages of evolution and is set to become the next industrial revolution.<sup>3</sup>

Space commerce has had a major influence on world space policy and research. Though the first space race proved the technological and military prowess of the two superpowers, the post Cold War scenario is a multinational struggle to command the commercial opportunities of space. The commercial space age was born in 1965 when the US satellite 'Early Bird', the first commercial communications satellite, went into orbit. In 1980, private entities like Space Services Inc. began testing rockets. In 1982, the company launched its first rocket, Conestoga-1. This set the trend for garnering billions of dollars per year from space-based products and services. The US took the lead in emerging technologies for space-based applications. In 1985, the Soviet Union began marketing contracted satellite launches on the Proton and Zenit rockets. In 1988, the US announced a new space policy that included a new commercial space initiative to encourage US commercial satellite launches to be privatised and limit the National Aeronautics and Space Administration's (NASA's) involvement in commercial space operations.<sup>4</sup>

The global space industry revenue is valued at \$ 335 billion (as of 2015). A significant portion of this goes towards communication services. In the satellite launch segment, the number of satellites launched was 209 in 2016 and 242 in 2017. This is likely to go up to 300 in the next two years. The

---

3. 'How Can Space Support the Fourth Industrial Revolution?', at <http://spacenews.com/sponsored/industrial-revolution/>. Accessed on December 8, 2017.

4. "Commercial Satellite Launch History", at <http://www.ilslaunch.com/node/33>. Accessed on November 14, 2017.



**India's success with the Polar Satellite Launch Vehicle (PSLV) since 1994 in launching foreign satellites on a rideshare basis and its success with the Chandrayaan and Mangalyaan missions has been a major contributor in propelling India into the world space industry.**

number of satellites launched into LEO will see an exponential rise.<sup>5</sup> The growth rate of the space industry has been 9.7 percent in 2014 and 10 percent in 2015<sup>6</sup>.

India is emerging as a significant player in the space business though its market share is a mere 3 percent. India's success with the Polar Satellite Launch Vehicle (PSLV) since 1994 in launching foreign satellites on a rideshare basis and its success with the Chandrayaan and Mangalyaan missions has been a major contributor in

propelling India into the world space industry. A launch by Ariane-5, the most successful commercial rocket in use right now, costs more than \$100 million, while that by SpaceX's Falcon 9 costs around \$62 million. When SpaceX introduced Falcon 9, there was serious disruption in the market, with Arianespace and other firms scrambling to bring costs down. In comparison, a PSLV launch costs \$15 million, which has put India in the category of preferred launch services provider.<sup>7</sup> However, the Indian Space Research Organisation's (ISRO's) competency is restricted to the LEO segment.

There is a growing demand for satellites for weather forecasting, Earth observation, remote sensing, broadband and emerging innovative space applications. To cater for the growing demand, space entrepreneurship, privatisation of space manufacturing and facilities, and commercialisation of space are being seen on a large scale across the world. Governments are no longer the dominant space operators. Today, a range of private companies like SpaceX, Boeing, Blue Origin, Orbital ATK and Virgin Space are developing space launch systems and competing with government run space agencies like NASA, Roscosmos, Arianespace, etc. Space

---

5. Rudraneil Sengupta, "India's Space Business is Ready for Lift-off", June 15, 2017, at <http://www.livemint.com/Science/tWvAvnsZ7GQEiYhopKU6tM/Indias-space-business-is-ready-for-liftoff.html>. Accessed on November 14, 2017.

6. Ram Jakhu, *Global Space Governance: An International Study* (Springer International Publishing, 2017), p.6.

7. Sengupta, n. 5.

commercialisation is among the dominant contemporary themes. In the coming years, space commerce will clearly be a major contributor to a nation's economy.

#### **MILITARY APPLICATIONS OF SPACE**

During the history of space exploration, the motives have had more reasons than just scientific potential. People generally believe that leading space organisations are exploring the universe purely for academic purposes, but the fact is that space plays a huge role in military planning and execution.

In fact, much of the exploration that space

powers have already achieved would not have been possible but for the military motives that underpin most space missions.

The Cold War era necessitated a strategic reconnaissance capability which arose out of intense competition and mutual suspicion amongst the superpowers. The Soviet Union's positioning of nuclear weapons around the world threatened the very existence of the USA. Hence, developing capabilities for reconnaissance on areas which could not be filmed despite aerial reconnaissance by aircraft like the U2 was vital for the survival of the USA. This led to the creation of the world's first military satellites by the US in 1959, which were under project 'Corona'—recce satellites using recoverable film. The utility of satellites for military purposes kept on increasing thereafter through the wars of the 20th century, and the Gulf War of 1991 was a clear watershed moment and came to be known as the "first space war". Since the space race of the early 1960s, the US and Russia (erstwhile USSR) have increasingly utilised military satellites as a key component of military strategy and national defence for the purposes of communication, navigation, surveillance, and reconnaissance.

Space-based systems are becoming an increasingly important component of military power. The military applications of satellites being widely

**The military applications of satellites being widely employed by space-faring nations are communications, imagery/Earth observation, navigation, mapping, meteorology, early warning, search and rescue, Signals Intelligence (SIGINT), geodesy and surveillance.**

employed by space-faring nations are communications, imagery/Earth observation, navigation, mapping, meteorology, early warning, search and rescue, Signals Intelligence (SIGINT), geodesy and surveillance. With these applications now covering almost the entire spectrum of war as an enabler, space-based assets are being viewed as a 'force multiplier'—which multiplies the effectiveness of combat forces.

#### **ADVANTAGES OF SPACE-BASED ASSETS OVER AIRBORNE ASSETS**

Most of the space applications of satellites, specifically surveillance and reconnaissance, can be done through airborne platforms also. However, spaceborne platforms will have the advantage of greater standoff and less risk to the platform itself. Space platforms have enormous durability on station, whereas, those in the atmosphere are limited in endurance by fuel supplies and /or crew endurance. One of the greatest advantages of space reconnaissance assets is that of freedom of operation in the medium without violating a nation's air space. One cannot transit through the air space above any state without its consent, but the same is not true for space platforms. Sea-based air power has also had a great advantage in the freedom of the seas, and in space, the benefit is even greater.

#### **DUAL USE CONUNDRUM**

Owing to its civilian and military value, satellite technology is considered dual-use. Although outer space is meant to be used only for peaceful purposes, the term "peaceful purposes" was never clearly defined and it is now accepted that this would include commercial, scientific and developmental activities as well as military applications. However, the limits to military utilisation of space are not clearly defined in any international treaty. While this shortcoming is an advantage for countries with advanced space technologies in military adventurism, it goes against the underlying principles of peaceful exploitation of outer space. Space technologies and satellites, in particular, are intrinsically of dual-use nature and, hence, concerns of proliferation and misuse will trigger serious attempts to control the spread of technology. There are about 1,800 artificial satellites orbiting

the Earth, and around 50 per cent have been used for military purposes at some point in their lifespan. Typical dual-use capabilities are illustrated in Table 1 below:

**Table 1**

<b>Satellite Type / Space System</b>	<b>Civilian Application</b>	<b>Military Application</b>	<b>Specific Military Application</b>
Earth Observation	Yes	Yes	Imagery for ISR
Communication	Yes	Yes	Datalinks for real time targeting, military communication, ELINT
Navigation / GPS	Yes	Yes	Accuracy of navigation and targeting, precise location
Weather	Yes	Yes	Route and target area weather forecasts for success of operations
Launch Vehicle	Yes	Yes	Can be converted to ICBM / ASAT vehicle

Dual-use technologies pose a unique challenge to the proponents of peaceful uses of outer space. Most civilian applications would also have a military use which is difficult to assess. Moreover, there can be several payloads on a satellite, and the purpose of the payloads cannot be ascertained after launch by an inspecting agency. There are no reliable means of pre-launch verification under the existing international space law. The development of the space launch vehicles in itself is treated as possessing the technical prowess to convert space launch vehicles into Intercontinental Ballistic Missile (ICBM) rocket launchers. The dual-use potential of satellite technology promotes an environment of suspicion, and the potential space capability of a state is perceived as an imminent threat which produces

enmity and further heightens existing security dilemmas, as demonstrated by events related to North Korea.

Talks on 'space arms control' have been on for many years under the ambit of the United Nations Office for Outer Space Affairs (UNOOSA) and the UN General Assembly (Committee on Disarmament) with the sole purpose of preventing misuse of space for military purposes which would eventually progress to weaponisation of space. This is an irreversible process, and many countries are lobbying against weaponisation. However, little progress has been made as the main player in the space superpower lobby, the US, is reluctant to take a stance in favour of peaceful utilisation of space, mainly because of its necessity to dominate outer space and secure its interests.

The quest to remain dominant in space technologies also necessitates control of space technology proliferation. Acquiring these technologies from a space superpower is, hence, not an easy option for the developing nations. Sanctions imposed on a country violating technology proliferation norms and seen as crossing weaponisation capability barriers, often also involve isolation from space technology sharing agreements.

As seen from the Indian perspective, India has achieved significant capabilities in satellite manufacture, launch and monitoring. Enviably progress is being made in space exploration. However, for historical reasons, much of the Indian expertise is directed towards peaceful exploitation of space. The space technologies possessed by India are all dual-use in nature, and thereby closely monitored by the technology control regimes of the advanced countries. India will, thus, have to strike a delicate balance between civil and military use of its space-based assets to avoid sanctions.

## **SPACE SECURITY**

Across the world, around 70 government space agencies are encouraging and enhancing space capabilities, which means that space activities are expected to expand exponentially as more satellites are launched in the near future. Today, more than 1,793 operational satellites (Table 2)<sup>8</sup> are orbiting

---

8. Union of Concerned Scientists, "UCS Satellite Database", at <http://www.ucsusa.org/nuclear-weapons/space-weapons/satellite-database#.WgvYy7aWbIU>. Accessed on November 15, 2017.

the Earth, including 55<sup>9</sup> Indian satellites. Interestingly, there are 8,048 objects launched into outer space and registered with the United Nations Office for Outer Space Affairs (UNOOSA)<sup>10</sup>. Table 2 below is merely indicative of the large numbers of satellites in operation and the US' share of satellite holdings (it includes launches upto August 31, 2017).

**Table 2: Composition of Satellites Launched into Space**

Total number of operating satellites: 1,738			
United States: 803	Russia: 142	China: 204	Other: 589
LEO: 1,071	MEO: 97	Elliptical: 39	GEO: 531
Total number of US satellites: 803			
Civil: 18	Commercial: 476	Government: 150	Military: 159
Total number of Indian satellites : 55			
Civil / Government: 54	Military : 01 (GSAT-7 : Navy)	Commercial : Nil	

The use of space for military purposes is expanding. Military entities are increasing their use of, and reliance on, commercial and civil satellites. Dual-use and hosted payloads complicate the traditional divide among military, civilian, scientific and private commercial ventures. Having seen the applications of space-based assets and the dual-use conundrum, it is amply clear that any intrusion, manipulation or damage to these vital orbiting assets can cause severe disruption in livelihoods and social well-being on Earth. More importantly, a space dependent nation can become militarily impotent if its satellites are impeded by an opposing force. There are increasing concerns with regard to the weaponisation of space by states. The fear that terrorists / rogue states might use space as their next battleground is also beginning to emerge. Security of space-based assets, thus, assumes vital importance in a nation's security objectives.

9. ISRO, "Indian Spacecraft", at <https://www.isro.gov.in/spacecraft>. Accessed on October 4, 2017.

10. United Nations Office for Outer Space Affairs, "Online Index of Objects Launched into Outer Space", at [http://www.unoosa.org/oosa/osoindex/search-ng.jsp?lf\\_id=](http://www.unoosa.org/oosa/osoindex/search-ng.jsp?lf_id=). Accessed on November 15, 2017.

**While it is difficult to compare the advantages of US military space systems with those of the rest of the world, it would be a mistake to underestimate the rapidity with which other states are beginning to use space-based systems to enhance their security.**

The US is currently investing billions of dollars annually in the development and deployment of a wide range of space systems which are revolutionising the conduct of warfare. At present, no country can rival, or contest, US space dominance or the advantages that this provides to its terrestrial military operations. While it is difficult to compare the advantages of US military space systems with those of the rest of the world, it would be a mistake to underestimate the rapidity with which other

states are beginning to use space-based systems to enhance their security.

It is well known that although the Outer Space Treaty (OST) was formulated in 1967, to preserve outer space for peaceful activities, it did not prohibit utilisation of space systems for military purposes as long as Weapons of Mass Destruction (WMDs) like nuclear weapons were not involved. While use of outer space for military support functions such as reconnaissance, communication and weapon guidance through GPS can certainly not be classified as peaceful purposes, these are nevertheless not considered unlawful acts because there are no international treaties prohibiting such military oriented space applications. Network-Centric Warfare (NCW) capabilities are increasingly dependent on outer space capabilities. The role of space in a nation's security infrastructure is, thus, increasing rapidly, and its impact on the regional and global balance of power equations is slowly altering global stability and security. It is becoming increasingly clear that the deterrence value of space capabilities will play a major role in national security.

Outer space has today become integral to the global and national socio-economic development activities of most progressive countries, and at the same time, militarisation of space is also on the increase as space capabilities are getting embedded into security and war-fighting doctrines of leading space-faring nations. Several countries are striving to build indigenous space capabilities to ensure the security of space assets for exploiting the space applications optimally

during peace-time as well as war-time. Besides the leaders in space technology (the US, Russia, the EU and China), other countries like India, Japan, Israel, North Korea and Brazil are gaining self-reliance in space technology. It is only a matter of time that space infrastructure gets embedded in the war-fighting doctrines of the emerging space powers.

#### VULNERABILITY OF SPACE INFRASTRUCTURE

The degree of dependence of a nation on its space infrastructure is a source of its vulnerability. Space infrastructure and space

capabilities would, in the years to come, represent an easier target than other conventional terrestrial targets as these have no direct implications of human casualties, and, hence, we should expect interference with them. As seen in the unprecedented US military capability, the space-based infrastructure is its nervous system. Though the land, sea and air forces will continue to fight the surface war, these missions will not succeed if not supported through space. A US Space Commission's findings have described the US as an attractive candidate for a "Space Pearl Harbour".<sup>11</sup> Inability or lack of vision to protect satellites, their ground infrastructure or the data links from an enemy attack would result in total disruption of services for a considerable time as these assets cannot be replaced quickly. Each of these elements of space infrastructure has its own unique vulnerabilities, which can be targeted by distinctive methods using emerging technologies. The ground infrastructure is vulnerable to conventional attacks from the ground, air and space. The data links can be jammed, spoofed or even hacked using electronic and cyber warfare techniques. Satellites and other space-based assets are vulnerable to a range of attacks, including Anti-Satellites (ASATs), space planes, directed

**Inability or lack of vision to protect satellites, their ground infrastructure or the data links from an enemy attack would result in total disruption of services for a considerable time as these assets cannot be replaced quickly. Each of these elements of space infrastructure has its own unique vulnerabilities.**

---

11. Charles V Pena and Edward I Hudgins, "Should the United States 'Weaponise' Space? Military and Commercial Implication," *Policy Analysis*, No.427, March 18, 2002.



energy weapons (land or space-based) like laser and Electro-Magnetic Pulse (EMP) weapons or space-based weapons like space mines and parasite micro/nano satellites. The options are endless. Hence, the importance of *space control*, an area in which countries like the US, Russia and China have taken the lead.

### **SPACE CONTROL**

As the military and commercial reliance on satellites has grown in unimaginable ways, so has the realisation that space-based assets comprise a '*Centre of Gravity*', likely to be targeted both in war and peace by unfriendly countries. The '*Centre of Gravity*' is described as "an area of critical vulnerability, a successful attack against which can be decisive in the outcome of a war (Warden's model)".<sup>12</sup> This can also be extended to peace-time when a satellite can be made dysfunctional to deny the adversary information superiority. While space systems have proven to be force enhancement tools in wars of the past, and proven enablers of war, the focus is now shifting to control space for national objectives while denying it to the adversary. The national space policies and military space doctrines are gradually shifting beyond utilisation of space as an *enabler* to seeing space as a vital resource, thus, competing for control of the environment, which we call 'outer space'. Many nations are now embarking on programmes for space control and space force projection. This will inevitably see a transition from 'militarisation of space' to 'space weaponisation'. *Space control is, hence, the next logical step in dominating the ultimate high ground, as space in the years to come is not just an emerging battlefield, but a gateway to prosperity for those who have control over it.*

There have been many theories on space power and its applications related to space control. However, military doctrines are still evolving to include space power. Today, the importance of space for economic and military activity resembles the conditions of maritime commerce and naval power in the late 19th century. In view of the similarities between space and the seas as a common heritage of mankind which we know as the global commons, space comprises an arena for development, technological upgradations, commerce, transportation, observation, exploration and

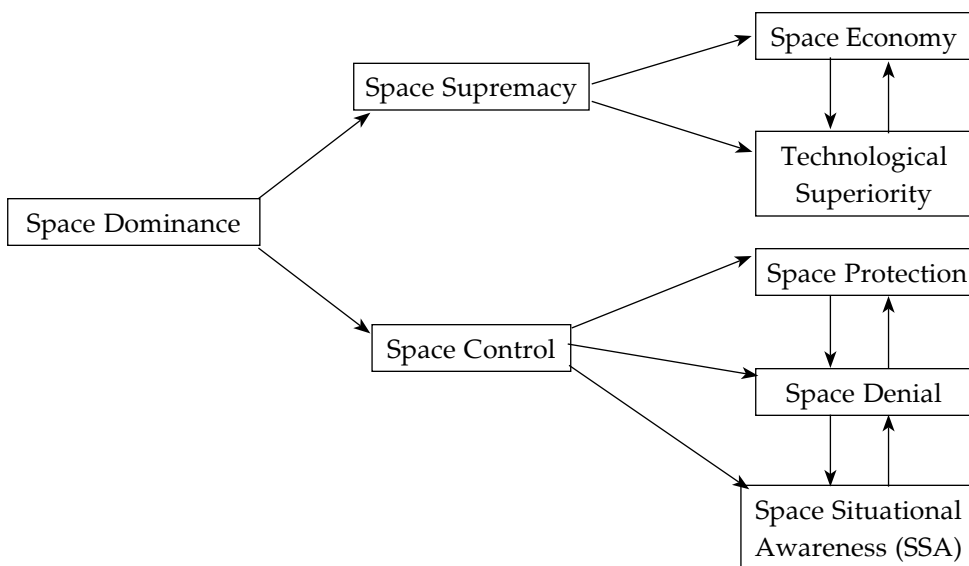
---

12. Milan N Vego, "Joint Operational Warfare: Theory and Practice," available at <https://books.google.co.in>. Accessed on November 15, 2017.

future conflict. Comparisons can be drawn between A.T. Mahan's elements of sea power<sup>13</sup> and the emerging form of space power as seen today, and current interpretations of space control are in contrast with those of sea control. Mahan, in one of the many sea power theories, stated that "great powers will necessarily have to be maritime powers" and "control of the seas is essential for control over the world". An analogy with space highlights the importance of space control.

Ostensibly, the space economy is a major driver for space security. A well-established space economy and technological superiority is a precursor to space supremacy. Space control is essential to maintain space supremacy. A combination of space supremacy and space control, thus, gives a condition of 'space dominance', also called *full spectrum dominance* (Fig 1). Thus, it can be stated that the economy, technology, and security are interdependent activities and one flows from the other. They represent the economic, technological and military dimensions of national power.

Fig 1



13. Alfred Thayer Mahan's, "The Influence of Sea Power Upon History 1660-17," is widely regarded as the first important study of the relationship between naval affairs and international politics.

Starting in the early 1980s, both civilian and military scholars have tried to systematically analyse the different ways in which one can think about the role of the space environment and its use for military operations. A number of schools of thought have been developed by scholars such as David Lupton, Peter Hays and James Clay Moltz. Col. David E. Lupton of the Air Power Research Institute, USA, described these schools of thought and differentiated among the *sanctuary*, *survivability*, *control* and *high-ground* schools in his work on space power doctrine<sup>14</sup>. These schools of thought display the role and nature of military activities in space. These are summarised below:

**Table 3**

<b>School of Thought</b>	<b>Space Doctrine</b>
Sanctuary	Space assets are used to stabilise the standoff between nuclear powers, but offensive capabilities are not deployed so as to prevent triggering a war that would put at risk the benefits derived from these assets.
Survivability	Space systems are considered invaluable to support war-fighting on Earth, but are also inherently vulnerable.
Control	Conflict in space is considered inevitable and it is essential to ensure one's freedom of operation and deny the use of space to adversaries, which requires both defensive and offensive space capabilities
High Ground	Space is considered as high ground from which future wars will be decided, and, therefore, it is essential to possess the entire spectrum of war-fighting capabilities in space, including space-based assets for force projection on the ground

---

14. David E. Lupton, "A Space Power Doctrine", downloaded web document, at [www.dtic.mil/get-tr-doc/pdf?AD=ADA421942](http://www.dtic.mil/get-tr-doc/pdf?AD=ADA421942). Accessed on November 7, 2017.

The sanctuary regime in space existed till 1985, when President Reagan's Strategic Defence Initiative (SDI) altered the prevailing "peaceful" status of space. Two major events in 1990-91 changed the way world powers viewed the utility of space. Firstly, the Gulf War (Operation Desert Storm) demonstrated how space-based Command, Control, Communication, Computers, Intelligence, Surveillance, Reconnaissance (C4ISR) and navigation capabilities could play a crucial role in winning a conventional war. Secondly, the break-up of the Soviet Union changed the geopolitical stability of the world, restructuring the world into a multipolar space order which also resulted in the US, Russia and China emerging as the dominant space powers. The break-up of Soviet Union witnessed the emergence of new space powers, especially the European Union (EU), Japan and India. Russia inherited the space heritage of the erstwhile Soviet Union and remains a dominant space power along with the US. The SDI created a situation that destroyed the sanctuary regime in space. The dual-use applications of space assets and research on new space weapon technologies changed the nature of space in a fundamental way. Hence, the 'sanctuary' regime of the Cold War era transitioned into a 'survivability' regime in space during the early 1990s, and the 21st century is seeing a clear shift to a 'control' regime in space.

While the US government never endorsed any of these schools of thought or engaged in public debates about them, statements by US officials suggest that it is leaning towards the 'control school'. This was best demonstrated by the then Secretary of Defence, Ash Carter, in his testimony at a hearing before the Senate Appropriations Committee in April 2016:

*While at times in the past, space was seen as a sanctuary, new and emerging threats make clear that's not the case anymore, and we must be prepared for the possibility of a conflict that extends into space.<sup>15</sup>*

This statement is indicative of the shifting focus in US military thinking about space activities. It no longer treats space as a conflict-free environment,

---

15. Maximilian Betmann, "A Counterspace Awakening?", at <http://www.thespacereview.com/article/3247/1>. Accessed on November 7, 2017.

but rather as a war-fighting domain in which it has to be able to deal with hostile threats. The US explicitly seeks complete freedom of action in space to fulfill its national security and foreign policy interests. The US is not seen to accept any limitations on the access to space or its utilisation in the pursuit of its national security interests. It would seek to achieve full spectrum dominance in space – a dominating space economy and the entire spectrum of space control capabilities. At the same time, it would aim to deny others' access to, and use of, space to secure its own interests. The US is, therefore, opposed to any international legal regime regulating or restricting the use of space.

Russia, being the second most advanced space-faring nation, has space as an important part of its military modernisation programme, along with promotion of a multipolar space world order to counter the US hegemony. Russia has developed an offensive space control and space denial programme, and is in possession of Anti-Satellite (ASAT), and other military space technologies; however, it is opposed to weaponisation of space. While the European Space Agency (ESA) maintains its leadership role in space systems, it is oriented towards securing the benefits of space to its citizens. China is an emerging space power and is slowly reaching a position that is capable of challenging US predominance in space. It has a well-developed space programme with an orientation towards military applications and offensive space capabilities, as evidenced from its ASAT tests since 2005. All other emerging space powers are mostly oriented towards 'peaceful purposes' barring North Korea whose capabilities are doubtful. India, on the other hand, is well poised to develop space control and space denial capabilities, but is committed to peaceful exploitation of space.

Space control essentially involves protecting space infrastructure and space-based assets from disruption or damage by an enemy or any other agency, knowingly or otherwise. It can be said to comprise *space protection*, *space denial* and *space situational awareness* (Fig 1). While *space protection* involves securing own space assets from disruption / damage, *space denial* means denying an enemy access to its space resources during a conflict. *Space control* and *space supremacy* together contribute towards *space dominance* which

will be crucial for any nation for achieving its national security objectives. The strategy for *space control* can be either defensive (protecting own space assets) or offensive (degrading / destroying the enemy's space assets). *Space situational awareness* would be a prerequisite for any space mission. While space dominance is an overwhelming superiority in space and offers unrestricted freedom of operation of space assets, space control, through space protection and space denial, will be limited in time and space, and will be more practical in a multipolar space order.

*Space protection, space denial and space situational awareness* are, hence, the primary requirements towards space security through military means and need a doctrinal approach for planning, training and execution. Contemporary military space missions could, thus, be broadly classified as given in Table 4 below:

**Table 4**

<b>Broad Purpose / Scope</b>	<b>Space Role / Mission</b>
Control of space environment	Counter-space missions : space denial (offensive) and active defence (space-based force application).
Protecting space-based assets	Space protection : space enabling operations through passive protection measures.
Military enabling and combat sustaining applications through satellites	Combat enabling operations (in support of ground, sea and air military operations).
Tracking and manoeuvring space assets for avoiding collisions, and for space surveillance.	Space situational awareness operations

Space power is an extension of air power in the fourth dimension – space – and, hence, parallels can be drawn with air power doctrines on executing each of the above space missions. A well-orchestrated space doctrine, coupled with organisational and infrastructural support and demonstrated capabilities has an effective deterrence value.

**A USAF manual**  
*(Functions and Basic  
Doctrine of the USAF),*  
**published in 1979,**  
**asserted that space**  
**support, force**  
**enhancement and space**  
**defence were the three**  
**missions that air force**  
**space operations should**  
**execute.**

**SPACE PROGRAMMES AIMED AT SPACE  
CONTROL (US, RUSSIA AND CHINA)**

**USA:** The American Space Act of 1958 was an important development creating NASA to pursue civilian space programmes, thus, restricting the Department of Defence (DoD) military space development. The Advanced Research Projects Agency (ARPA), later DARPA, was created under the DoD in the same year for creating breakthrough technologies for national security. In 1962, the DoD published a White Paper called the “Air Force Space White Paper” which put emphasis on the air force’s two reasons for being in space as: (1) enhancing the US military posture; and (2) having military patrol ability in space. It went on to stress the need to protect US scientific activities in space and advocated development of space weapons.<sup>16</sup> The Outer Space Treaty of 1967 prevented nuclear weapons being put into orbit in outer space, but did little to prevent militarisation of space and non-nuclear weaponisation of space. A major push to the US space programme came through a decision in 1972 to construct a space shuttle. The shuttle was a revolutionary concept of improving mission flexibility and capability by on-orbit check-out of payloads, recovery of malfunctioning satellites for repair and re-use, re-supply of payloads on orbit, thus, extending their lifetime. These concepts are also reflected in the US Air Force (USAF) policy of fulfilling its militarisation requirements. In 1976, the Soviet decision to resume ASAT weapons testing after a four-year moratorium following the Anti-Ballistic Missile Treaty (ABM) Treaty in 1972, led to a number of US policy developments that increased the role of space in the US military’s operational planning. The realisation of space’s growing military importance was reflected in the 1977 USAF document that affirmed the USAF’s primary responsibility in space as involving development of weapon systems, military space operations and protecting the free use of space by providing

---

16. Bert Chapman, *Space Warfare and Defense* (California, ABC-CLIO, 2008), p.19.

essential space defence capabilities.<sup>17</sup> This served as a stepping stone for discussion and action on space issues of the future. A USAF manual (*Functions and Basic Doctrine of the USAF*), published in 1979, asserted that space support, force enhancement and space defence were the three missions that air force space operations should execute. This document went on to assert that using space systems multiplied the effectiveness of surface, sea and aerospace forces. The onset of President Reagan's Administration in 1981 saw a major defence space policy review. The Air Force Space Command (AFSPACECOM)

was established in 1982, and a unified US Space Command (USSPACECOM) was established in 1984<sup>18</sup>. A revised USAF manual (*Military Space Doctrine*) was released in 1982, which described space as the outer reaches of the air force's operational medium, and an environment useful for conducting air force missions. It also asserted that aerospace power provided credible war-fighting capability, from the battlefield to the highest orbit in space, and air force interests included performing war-fighting missions with space-based weapon systems, consistent with the national security requirements. The Air Force Space Plan was published in 1983 and it identified four terms for space operations: space control, space support, force enhancement and force application, each term having its own distinctive definition. The Air Force Space Plan described *space control* as maintaining freedom of action in space and denying such autonomy to an enemy. President Reagan's Strategic Defence Initiative (SDI) provided the necessary boost for the space programmes, mainly intended to provide a shield from the ground to space against Soviet nuclear missiles. In 1989, the USAF issued a plan to implement

**The Air Force Space Plan was published in 1983 and it identified four terms for space operations: space control, space support, force enhancement and force application, each term having its own distinctive definition. The Air Force Space Plan described *space control* as maintaining freedom of action in space and denying such autonomy to an enemy.**

---

17. Ibid., pp.24-25.

18. Ibid., pp.29, 31.



a Blue Ribbon panel recommendation. The roadmap was intended to project military space policy into the 21st century by linking space systems to war-fighting requirements, global strategy and space warfare. The collapse of the Soviet Union was thought to have ended the role of the Soviet military space policy in prompting US military space programmes, however, a series of domestic and global events in the early 1990s influenced, and accelerated US efforts to develop a viable military space programme. Operation Desert Storm was a watershed event for space systems as it enhanced space as a major military operational player. Successive DoD directives and air force manuals have thereafter represented a growing emphasis on integrating military space into the air force and military operational doctrines. A notable addition was the Air Force Counter-Space Doctrine of 2004 which stressed on threats like Radio Frequency (RF) jamming, laser systems, EMP weapons, ASAT weapons and information operations against satellites and how to deal with them.<sup>19</sup> Highlights of the US anti-satellite programmes are given below:

- **Kinetic Energy Kill Vehicles:** The US pursued ABM/ASAT systems partly because of a perceived threat of Soviet “orbital bombardment systems,” in which a weapon would be placed into orbit and then accelerated down to Earth in an attack. In February 2008, the US demonstrated the ASAT capability of its Aegis sea-based missile defence system by destroying a non-responsive US satellite at an altitude of 240 km.
- **Inspection / Interception / Destroyer Satellites:** US space shuttles had the ability to rendezvous with a satellite and pull the satellite into its cargo bay. After the shelving of the space shuttle projects, the NASA Demonstration for Autonomous Rendezvous Technology (DART) programme launched a satellite in 2005 on a short mission to approach a target satellite without assistance from ground personnel. The mission failed when the DART satellite collided with its target. The USAF, reportedly has had more success with its Experimental Satellite System 11 (XSS-11) programme, and has been developing “rendezvous and proximity operations, autonomous

---

19. Ibid., pp.32-52.

mission planning, as well as other enabling space technologies.<sup>20</sup> The US has conducted a number of interception missions: XSS-10 (2003), DART (2005), XSS-11 (2005-2006), MiTeX (2006-2009), GSSAP (2014), ANGELS (2014)<sup>21</sup>.

- **Air Launched Miniature Vehicle (ALMV):** In June 1982, the United States announced its intention to test a new-generation ASAT weapon: the Air-Launched Miniature Vehicle (ALMV), which consisted of a two-stage missile launched from an F-15 aircraft flying at high altitude. The missile could hit a satellite in LEO and destroy or disrupt the satellite in a high-speed collision. The first and only test against a satellite was performed in October 1985 when an ageing satellite—Solwind—was destroyed at an altitude of 555 km. This test highlighted in a dramatic way the consequences of destructive ASAT technology. The USAF intended to pursue the ALMV programme vigorously, scheduling a number of tests for 1986, but in December 1985, the US Congress banned further testing of the system on satellites. The air force continued to test the ALMV, but stayed within the limits of the ban by not engaging a spaceborne target. In 1987, the political opposition to the ALMV system appeared entrenched, and the air force ended the programme.<sup>22</sup>
- **Laser Weapons:** In 1988, the air force began plans for other ASAT programmes, in particular a ground-based laser system, in response to the development of a laser system by the Soviet Union that could pose a significant threat to both satellites and ballistic missiles. The US Navy coupled its ground-based, megawatt-class Mid-Infrared Advanced Chemical Laser (MIRACL) to the Sea Lite beam director, a large and agile mirror that can direct the MIRACL's beam, at a missile range in New Mexico. In 1997, the MIRACL laser and Sea Lite beam director were tested to illuminate a satellite orbiting at an altitude of 420 km. The results of the test were classified, but the DoD did report that the system tracked and illuminated the satellite, and the lower-power laser either temporarily

---

20. Laura Grego, "A History of Anti-Satellite Programs", January 2012, at [http://www.ucsusa.org/sites/default/files/legacy/assets/documents/nwgs/a-history-of-ASAT-programs\\_lo-res.pdf](http://www.ucsusa.org/sites/default/files/legacy/assets/documents/nwgs/a-history-of-ASAT-programs_lo-res.pdf). Accessed on November 28, 2017.

21. "Russia and Anti-Satellite Programs", at [www.globalsecurity.org/space/world/russia/asat.htm](http://www.globalsecurity.org/space/world/russia/asat.htm). Accessed on November 27, 2017.

22. Chapman, n.13. p.144.

**The US Airborne Laser (ABL) programme, whose goal is to create a megawatt-class laser small enough to be carried in an aircraft and powerful enough to destroy missiles during their boost phase, can also be used to attack and damage satellites at low altitudes.**

dazzled or damaged the satellite's sensor. This system has not been tested on a satellite since 1997.<sup>23</sup>

- The US Air Force Airborne Laser, (ABL), designated the YAL-1A, is carried on a modified Boeing 747-400F freighter aircraft, and is a megawatt class high-energy laser weapon system for the destruction of tactical theatre ballistic missiles. In February 2007, the ABL began a series of flight tests which included the first in-flight firing of the targeting laser at a simulated target in March 2007. The YAL 1A laser travels at the speed of

light to destroy ballistic missiles in their boost phase of flight. In January 2010, the high energy laser was fired to intercept a test missile. The US Airborne Laser (ABL) programme, whose goal is to create a megawatt-class laser small enough to be carried in an aircraft and powerful enough to destroy missiles during their boost phase, can also be used to attack and damage satellites at low altitudes.<sup>24</sup> While technically successful, several limitations led to the ABL programme's cancellation in 2011.

- **Satellite Jamming:** In 2004, the United States deployed the ground-based counter-communications system. However, the specific capabilities of this system have not been disclosed. There were plans to upgrade the system in 2007.<sup>25</sup>
- **Space Planes:** In April 2010, the US Air Force launched a space plane prototype, the X-37B. It stayed in orbit for almost a year. A second prototype was launched in March 2011. The mission profile of the space plane programme is a mystery; however, some observers have inferred that the X-37B has a specialised military purpose towards counter-space

---

23. Grego, n. 20.

24. "Airborne Laser System (ABL) YAL 1A", at <http://www.airforce-technology.com/projects/abl/>. Accessed on December 5, 2017.

25. Jeremy Singer, "U.S. Air Force to Upgrade Satcom Jamming System", June 29, 2004, at <http://spacenews.com/us-air-force-upgrade-satcom-jamming-system/>. Accessed on December 5, 2017.

operations or as a space-based weapon testbed.<sup>26</sup>

**Russia:** The only country to have invested efforts and resources comparable to the US in developing space weapons is Russia (erstwhile Soviet Union). The Russians' efforts to develop a military space programme began towards the end of World War II, when they sought to gain information about the German V-2 rockets. Sergei Korolev, a Soviet aeronautical engineer, was working in a Soviet military supported Research and Development (R&D) centre before World War II. He was instrumental in conceiving the Soviet space programme, having conducted assessments of captured German rocket equipment, and played a key role in the launch of the Sputnik in 1957. Korolev became the chief developer of the Soviet long range ballistic missiles like the R-1 and R-2 and later the R-5 and R-7, gradually progressing from Intermediate Range Ballistic Missiles (IRBMs) to nuclear Intercontinental Ballistic Missiles (ICBMs). The Soviet leadership under President Khrushchev recognised the potential of the space programme as a focus of national unity and pride. Though it was projected as peaceful in nature, the Soviet government shared this technology with ideologically compatible nations like China. The Soviet military space developments were seen way back in 1963, when a satellite – the Polet-1 – was launched, which was the first satellite to manoeuvre in space by changing orbits, an essential capability for performing anti-satellite operations. The evolving organisational structure of the Soviet military space programme was reflected in the creation of the Central Directorate of Space Assets (TSUKOS) within the Ministry of Defence in 1964. TSUKOS was the primary organisation for directing Soviet military space programmes. The launch of a Tsytkon-2 rocket in 1967, capable of carrying anti-satellite weapons,

**The Soviet leadership under President Khrushchev recognised the potential of the space programme as a focus of national unity and pride. Though it was projected as peaceful in nature, the Soviet government shared this technology with ideologically compatible nations like China.**

---

26. Leonard David, "What Will the X-37B Military Space Plane Do on Its Next Mystery Mission?", May 19, 2015, at <https://www.space.com/29442-x37b-space-plane-fourth-mission.html>. Accessed on December 1, 2017.

was evidence of the Soviet intent to deploy such weaponry. During 1967, the Soviet Union also launched the Cosmos 139, which was the first test of its Fractional Orbital Bombardment System (FOBS). The 1968 Soviet military strategy echoed the Soviet military space policy of creating space weapon systems to enhance overall military combat effectiveness, to prevent other countries from using space, and for developing strategic offensive systems for space war-fighting. During the 1960s and 1970s, the Soviets made extensive efforts to develop ASATs, with some recognition of these efforts occurring as early as 1962. Between 1968 and 1982, an ASAT was tested 20 times in space. During each test, a dedicated target vehicle was launched into LEO. Five of the seven ASAT tests between 1968-71 were judged successful, with the tests being conducted at altitudes ranging from 230 to 1,000 km above the Earth's surface. Further tests brought in more improvements in sensors and intercept profiles. By the early 1980s, the Soviet military had significant anti-satellite capabilities. A US DoD assessment of Soviet military space programmes contended that the Soviets could launch the initial prototype of a space-based laser ASAT system in the late 1980s or early 1990s and the Russians were in a position to test a space-based ABM system in the 1990s.<sup>27</sup> As per a 1985 Central Intelligence Agency (CIA) assessment, the Soviets had acquired relevant technologies in areas such as space-based lasers, directed energy weapons and anti-missile defence systems. Post the collapse of the Soviet Union, their space launch rates had fallen by about 15 percent initially, and subsequently, the budget for military space programmes was slashed by 90 percent. Though this had not degraded Russian military space capabilities, there was no further R&D on new projects and there was a negative impact on space research. The last known test of a Russian ASAT took place in 1982, and the 2001-2002 edition of *Jane's Space Directory* described the Russian ASAT programmes as "inactive".<sup>28</sup> The lack of testing after 1982 raised some doubts about the operational status of the co-orbital ASAT. However, the Tsyklon-2 was flown frequently in support of ocean reconnaissance programmes. Nearly three years later, a Russian publication appeared to confirm its operational

---

27. Chapman, n.13, pp.189-191.

28. *Ibid.*, pp.195-197.

status.<sup>29</sup> In the early 2000s, the Russians began considering cooperating with the United States on aspects of missile defence, and both nations continued to respect the ASAT weapons-testing moratorium until the US destroyed a satellite during a 2008 test.

The highlights of the Russian anti-satellite programmes are given below:

- **KE Kill Vehicles:**
  - The 'Briz-k'(Naryad programme), a kinetic energy ASAT was developed in the mid-1980s as an ASAT to be launched on top of the SS-19 ICBM. It was tested a few times in suborbital flights in the early 1990s, but never deployed operationally.<sup>30</sup> The Briz-K was apparently designed to release one or several rocket-powered "kill vehicles" capable of intercepting orbiting satellites at altitudes of up to 40,000 km—much higher than the reach of earlier systems.
  - The test of a PL-19 Nudol missile took place on December 16, 2016. The launch, which was the fifth of the Nudol tests, originated from a facility near Plesetsk, about 500 miles north of Moscow, and was apparently successful, despite reports that no debris was detected by US monitoring stations, implying that no test target was destroyed<sup>31</sup>.
- **Military Interceptor/Inspector/Destroyer Satellites:** Russia's main and only dedicated ASAT system uses a co-orbital strategy.
  - In 2010, the space troops commander, who later headed the Russian space agency, said that Russia had again taken up the development of "inspection" satellites.
  - On December 25, 2013, a rocket was launched carrying a trio of Rodnik communications satellites to replenish the constellation which had been operational since 2005. The previous six launches had carried three Rodnik satellites, but this launch carried four— Kosmos-2488, -2489, -2490 and -2491. For several weeks in 2014, the object manoeuvred

---

29. "Co-orbital ASAT", at [www.globalsecurity.org/space/world/russia/coorb.htm#ref107](http://www.globalsecurity.org/space/world/russia/coorb.htm#ref107). Accessed on November 27, 2017.

30. "Briz [Breeze]", at [www.globalsecurity.org/space/world/russia/briz.htm](http://www.globalsecurity.org/space/world/russia/briz.htm). Accessed on November 27, 2017.

31. Weston Williams, "Russia Launches Anti-Satellite Weapon: A New Warfront in Space?", December 22, 2016, at [www.csmonitor.com/USA/Military/2016/1222/Russia-launches-anti-satellite-weapon-A-new-warfront-in-space](http://www.csmonitor.com/USA/Military/2016/1222/Russia-launches-anti-satellite-weapon-A-new-warfront-in-space). Accessed on November 27, 2017.

towards other Russian space objects, culminating in November 2014 when it rendezvoused with the upper stage that had placed it in orbit. That extra satellite was acknowledged as a satellite by the Russian Federation in a note to the United Nations in May 2014.<sup>32</sup>

- In May 2014, Russia announced that it had launched three Russian communications satellites, the Kosmos-2496, -2497, -2498. An additional object was along for the ride, orbiting a few kilometres away from the declared payloads. It manoeuvred under its own power, eventually making a close approach to the rocket stage that launched it in early November. The object was reclassified as the Kosmos-2499 by the US.<sup>33</sup>
- **Laser Weapons:** From the 1970s, the USSR was involved in an extensive, multifaceted programme to develop high-powered, ground-based lasers and microwave weapons. In 1991, a number of reports began to emerge about an effort to deploy Space-Based Lasers (SBLs) in conjunction with a strategic defence programme. The first mission in 1987 included the launch of a 'Skif-DM' payload, which was intended for testing the laser weapon. The Skif-DM failed to reach the orbit due to an attitude control problem and fell into the Pacific Ocean after separating from the booster. No further launch has been attempted.<sup>34</sup>
  - Russia resumed work on its airborne laser anti-satellite system with the 'Sokol Eshelon' system that included a laser deployed on the A-60 aircraft (a modification of the Il-76). The Sokol Eshelon system apparently has a capability to blind sensors of satellites in all types of orbits. A test of the system was conducted in August 2009. The aircraft was scheduled to perform its first test flight in 2013. It is unlikely to be capable of anything more than dazzling or partially blinding the sensors of observation satellites.<sup>35</sup>

---

32. Grego, n. 20.

33. Laura Grego, "Russia's Small Maneuvering Satellites: Inspectors or ASATs?", Union of Concerned Scientists (blog), at <http://allthingsnuclear.org/lgrego/russias-small-maneuvering-satellites-inspectors-or-asats>. Accessed on November 27, 2017.

34. "Lasers", at <https://www.globalsecurity.org/space/world/russia/lasers.htm>. Accessed on November 27, 2017.

35. "Russia to Resume Work on Airborne Laser ASAT", at [http://russianforces.org/blog/2012/11/russia\\_to\\_resume\\_work\\_on\\_airbo.shtml](http://russianforces.org/blog/2012/11/russia_to_resume_work_on_airbo.shtml). Accessed on November 27, 2017.

- **ALMV:** A more conventional ASAT programme was also underway in the late 1980s and early 1990s. A specially configured MiG-31 was designed to carry an air-launched missile equipped with a satellite-homing, kinetic-kill warhead. This was very similar to the US F-15 air-launched ASAT, successfully tested against a satellite in September, 1985. The status of the Russian air launched ASAT today is unclear, but Russian officials in 1992 indicated that future space tests were possible. The effort was suspended in the early 1990s and details are sketchy.<sup>36</sup>
- **Electronic Jamming:** Russia is likely to have jamming capabilities that are effective out to geosynchronous orbit, especially against non-military targets, which are relatively unprotected from such attacks.
- **ABM:** Moscow's current missile defence system features use of nuclear-tipped interceptors. Although such interceptors can be used against satellites, they have long been recognised as a poor ASAT option, partly because nuclear explosions in space result in collateral damage and would destroy all nearby satellites. Also, for weeks after the detonation, many more satellites could be damaged by radiation in LEOs. Use of such weapons would also violate the Partial Test Ban Treaty (PTBT) of 1963.<sup>37</sup>

**China:** China's space programme drew inspiration from the success of the Soviet space ventures and as a follow-up of their ballistic missile programme. China joined the group of space-faring nations when it launched its first satellite, the Dong Fang Hong-1 (DFH-1), on April 1, 1970. Apparently spurred by Soviet and American ASAT and ABM technology developments in the 1970s and 1980s, China began its own research on hit-to-kill technology in the 1980s. China's unease over the US SDI and the 1985 US ASAT test was the trigger for it to actively pursue ASAT technology and prompted creation of a research programme. While the China National Space Administration (CNSA), created in 1993, was the equivalent of NASA and controlled the civilian space programme, the military space research, production and operation was under the

---

36. "USSR/CIS Miniature ASAT", at [www.globalsecurity.org/space/world/russia/mini.htm](http://www.globalsecurity.org/space/world/russia/mini.htm). Accessed on November 27, 2017.

37. Grego, n. 20.



**China claims that the Aolong-1 is tasked with cleaning up space junk and collecting man-made debris in space. However, other reports suggest that the spacecraft, equipped with a robotic arm, is a dual-use ASAT weapon.**

Ministry of National Defence. The decade from 2000 to 2010 saw many achievements for China, including the manned space missions and testing of ASAT weapons. In October 2008, a Shenzou-VII mission involving a space walk by three astronauts drew international attention and caused a stir because a 40 kg Picosat (BX-1) released by the spacecraft came as close as 25 km from the International Space Station (ISS), and there was an apparent risk of collision. It was perceived by the international community as a test of a multipurpose killer

satellite.<sup>38</sup> A brief survey of recent tests by China (as given below) confirms that it is rapidly improving its counter-space programme and making advances in its anti-satellite systems. China's first ASAT test was conducted in May 2005 and its capabilities have come a long way since then. China's capabilities in hard and soft kill techniques are largely speculative, and shrouded in secrecy. The highlights of the Chinese anti-satellite programmes are given below:

- **Military Interceptor/Inspector/Destroyer Satellites:** China conducted a satellite interception, the 'SJ-12' mission, in 2010.<sup>39</sup> China has autonomous rendezvous and close-proximity capabilities in various stages of development. In June 2016, China launched the 'Aolong-1' spacecraft on a 'Long March 7' rocket. China claims that the Aolong-1 is tasked with cleaning up space junk and collecting man-made debris in space. However, other reports suggest that the spacecraft, equipped with a robotic arm, is a dual-use ASAT weapon. The 'Aolong-1' is believed to be the first in a series of spacecraft that will be tasked with collecting man-made space debris. It is also learnt that China is developing various co-orbital ASATs.<sup>40</sup>

---

38. James Clay Moltz, *Asia's Space Race* (New York: Columbia University Press, 2012), Ch 3.

39. Grego, n. 20.

40. Harsh Vasani, "How China Is Weaponizing Outer Space", January 19, 2017, at <https://thediplomat.com/2017/01/how-china-is-weaponizing-outer-space/>. Accessed on November 30, 2017.

- **KE Kill Vehicles:** In 2007, China used a mobile ground-based missile to launch a homing vehicle that destroyed one of its decommissioned FY-1C weather satellite via a direct impact. China had been developing this 'hit-to-kill' technology since the 1980s, as an ASAT weapon and for ballistic missile defence, though the first test was undertaken in 2005. Subsequently, four tests took place in 2010, 2013, 2014 and 2017. The 2013 test involved a new missile, the DN-2 or Dong Neng-2, and the test was conducted in 'near geosynchronous orbit', where most of the US' ISR satellites are located. The direct ascent test, reached an altitude of 18,600 miles. In 2015, China tested the DN-3 exoatmospheric vehicle, reported to be capable of destroying US satellites at all altitudes.<sup>41</sup>
- **Laser Weapons:** In 1995, at defence exhibitions in Manila and Abu Dhabi, China displayed the ZM-87 laser weapon. In 2006, reports surfaced that China had illuminated a US satellite with a ground-based laser, perhaps more than once. While the details and purpose of the incidents were unclear, it is certain that China (and many other countries) have the capability to track satellites using low-power ground-based lasers.
- **Hypersonic Glide Vehicles (HGVs):** China has been developing HGVs since 2015 and has carried out two tests on the DF-17 missile in November 17, 2017. Though this is meant to be a land attack system, the HGV separates from the missile during the re-entry phase after transiting through space and glides to the target.

**Going by the events in space during the past decade, Russia and China seem to have perceived a need to offset any US military advantage derived from military, civil, or commercial space systems and are increasingly considering attacks against satellite systems as part of their future warfare doctrine.**

Going by the events in space during the past decade, Russia and China seem to have perceived a need to offset any US military advantage derived from

---

41. Ibid.

military, civil, or commercial space systems and are increasingly considering attacks against satellite systems as part of their future warfare doctrine. Both Russia and China have demonstrated a desire to pursue a full range of ASAT weapons as a means to reduce US military effectiveness. Some new Russian and Chinese ASAT weapons, including destructive systems, will probably complete development in the next several years. Russian military strategists view counter-space weapons as an integral part of broader aerospace defence objectives and are very likely pursuing diverse capabilities to affect satellites at all orbital altitudes and patterns. These diverse capabilities include directed energy (laser) weapons that could blind or damage sensitive space-based optical sensors, robotics technology designed for satellite servicing and space-junk removal (which can also be used to damage satellites), and electronic warfare attacks against space systems. Development is likely to focus on jamming capabilities against dedicated military satellite communications, imaging satellites, and Global Navigation Satellite Systems (GNSS), such as the US Global Positioning System (GPS).<sup>42</sup>

## CONCLUSION

The space doctrines of major space-faring nations like the US, Russia and China recognise space for socio-economic progress, and space commerce and space as another medium of warfare besides the land, sea and air. Their navigation, remote sensing and communication satellites are for peaceful civilian as well as military purposes, and their space doctrines exploit the dual-use conundrum. Other space-faring nations like the EU, Brazil, Iran, Israel and North Korea are following suit. Japan and India are following the peaceful exploitation of space. The increasing reliance on space and space-based assets necessitates adoption of a strategy towards space security.

In future wars, the side that knocks down the largest number of enemy satellites stands to gain a strategic lead. American and Russian ASAT weapons and other counter space capabilities existed during the Cold War,

---

42. Leonard David, "China, Russia Advancing Anti-Satellite Technology, US Intelligence Chief Says", May 18, 2017, at <https://www.space.com/36891-space-war-anti-satellite-weapon-development.html>. Accessed on November 27, 2017.

but due to military and ISR space assets being mainly used for strategic purposes, both sides exercised a certain degree of restraint, at least when it came to putting ASATs into operational use, since they were considered to be destabilising. China is the new entrant in ASAT capabilities with a potential to expand rapidly. With increasing reliance on space assets for conventional war-fighting, the situation which existed during the Cold War era and in the late 1990s has changed. The space-based assets of nations have become more vulnerable than ever before. Targeting of satellites or making them dysfunctional can change the course of a war. Any country which possesses Ballistic Missile Defence (BMD) technology can easily convert the weapon to target a satellite. Other options involving soft kill are also being aggressively developed. Hence, control of space and protection of space-based assets is vital for any country which relies on satellites for war-fighting. The most compelling reason for moving forward for acquiring at least the essential elements of a serious space control capability is that the space enabled nations are now heavily invested in, and dependent on, space capabilities, both military and commercial. Since these capabilities can only be expected to grow in importance over time, it is fair to presume that they will eventually be challenged by potential opponents.

*Space superiority is not our birthright, but it is our destiny.... Space superiority is our day-to-day mission. Space supremacy is our vision for the future.*

– Gen Lance Lord, head of the US Air Force Space Command<sup>43</sup>

---

43. Anup Shah, "Militarization and Weaponization of Outer Space", January 21, 2007, at <http://www.globalissues.org/article/69/militarization-and-weaponization-of-outer-space>. Accessed on November 13, 2017.

# ORGANISATIONAL GOVERNANCE OF CYBER SPACE IN INDIA

E. DILIPRAJ AND  
RAMNATH REGHUNADHAN

Cyber space is defined by the National Cyber Security Policy of India as “a typically complex digital world arena comprising varying interactions among individuals, software and services, in an ecosystem enabled by the distribution of Information and Communication Technology (ICT) networks (NWs) as well as devices”.<sup>1</sup> It is generally considered as a ‘public good’ that transcends the conventionally finite but perceived form of demarcated and delineated sovereign boundaries in the physical world. This transcending nature of cyber space and the related spatial paradigm exposes countries to a wide variety of circumstances, and can be exploited for malicious purposes by other nation-state(s) and non-state actor(s). The threat could emerge from ‘rival’ or ‘not-so friendly’ states, terrorists, criminals, anti-institutionalists, rival conglomerates or even from any random individual. In fact, as opined by Dr. APJ Abdul Kalam, the former president of India, “Cyber warfare is the biggest threat to national security which will render even the Inter-Continental Ballistic Missiles (ICBMs) insignificant as a security threat”.<sup>2</sup> An increase over the years in the number of incidents of cyber attacks that target

---

Mr **E.Dilipraj** is Associate Fellow at the Centre for Air Power Studies, New Delhi.

Mr **Ramnath Reghunadhan** is a Post-Graduate Student at Mahathma Gandhi University, Kerala.

1. “National Cyber Security Policy -NCSP 2013,” available online at [nciipc.gov.in/documents/National\\_Cyber\\_Security\\_Policy-2013.pdf](http://nciipc.gov.in/documents/National_Cyber_Security_Policy-2013.pdf). Accessed on May 16, 2017.
2. Air Mshl Anil Chopra, PVSM AVSM VM VSM (Retd), “Cyber: The Next Cold War”, 2016, available online at <http://www.defstrat.com/cyber-next-cold-war>. Accessed on June 1, 2017

**While cyber threats have become the new norm and cyber wars have become a reality in the current interconnected world, cyber space is still highly chaotic in terms of governance of the domain itself. Cyber related technologies are leapfrogging ahead at a rapid pace, giving no time for the establishment of a proper governance framework at all levels.**

the Critical Information Infrastructure (CII) could readily have a multiplier effect on the security of the people, creating a kind of ripple down effect on the capabilities as well as the strategic interests of the state. The sources of the threats and attacks have increasingly adopted strategies that are relatively of low-risk and low-cost in nature, specifically focussing on the susceptible targets.

An imminent, precisely coordinated set of attacks could greatly overwhelm the defences of government authorities, and deplete, overutilise or render obsolete the resources in hand. It could disrupt the functioning of the critical information systems, even creating a serious threat to the national security of the country.

While cyber threats have become the new norm and cyber wars have become a reality in the current interconnected world, cyber space is still highly chaotic in terms of governance of the domain itself. Cyber related technologies are leapfrogging ahead at a rapid pace, giving no time for the establishment of a proper governance framework at all levels. Nevertheless, governments across the world, collectively as well as individually, are striving hard to create governance frameworks in order to bring order into this highly volatile domain. Even at the global level, cyber space governance involves heated debates on various platforms with the immediate agenda for creating global norms for cyber space. With the growing dependence on cyber technology for e-governance and for providing other e-services across the globe, clearly, cyber space governance would be an indispensable aspect of any country's government in the near future. In this respect, this paper analyses the prevailing organisational governance of cyber space in India as well as the emerging challenges and loopholes, and offers suggestions in order to upgrade the governance structure in the country.

## INDIAN CYBER GOVERNANCE

The history of organisational governance of cyber space in India began in the mid-1970s, with the establishment of the National Informatics Centre (NIC), with the intent to provide Information Technology (IT) solutions to the country as a whole. Within just two years, a satellite-based nationwide Very Small Aperture Terminal (VSAT) network, called NICNET (the NIC Network), was established by the NIC.<sup>3</sup> In 1980s, the INDONET, a public service data network, became operational.<sup>4</sup>

This laid the foundation for the establishment of the Education and Research Network (ERNET), which was primarily intended to serve the academic and research purposes of the nation.<sup>5</sup> In the 1990s, India had only around five million telecom users,<sup>6</sup> and during the same period, the Telecom Regulatory Authority of India (TRAI) was created and was delegated with the powers to take decisions in regard to tariffs and related policy formulation(s).<sup>7</sup> Subsequently, it led to the formation of a new ministry, the Ministry of Information Technology (MIT), which was later merged with the Department of Telecommunications (DoT) to form the Ministry of Communication and IT (MCIT). In the beginning of the 21st century, the Telecom Dispute Settlement and Appellate Tribunal (TDSAT) was established. This ensued the inflow and imbibing of international best practices, and an effective Dispute Settlement Mechanism (DSM), which

**Over the years, even with a relatively low internet penetration rate, the internet user base in the country has grown enormously, and, today, India has the second largest number of internet users in the world, mainly owing to its humongous population.**

---

3. Madhu, "Networks (ERNET, NICNET, OCLC, INFLIBNET, DELNET, JANET, BLAISE)", 2012, available online at <http://netjrflibraryandinformationscience.blogspot.in/2012/04/unit-viii-networks-ernet-nicnet-oclc.html>. Accessed on May 16, 2017.

4. P. Raghavendra Rau and H. Raghav Rao, "INDONET: A PUBLIC SERVICE DATA NETWORK IN INDIA", 1993, available online at [https://flora.insead.edu/fichiersti\\_wp/Inseadwp1993/93-18.pdf](https://flora.insead.edu/fichiersti_wp/Inseadwp1993/93-18.pdf). Accessed on May 17, 2017.

5. IDSA Task Force Report March 2012, INDIA'S CYBER SECURITY CHALLENGE, Institute for Defence Studies and Analyses, New Delhi.

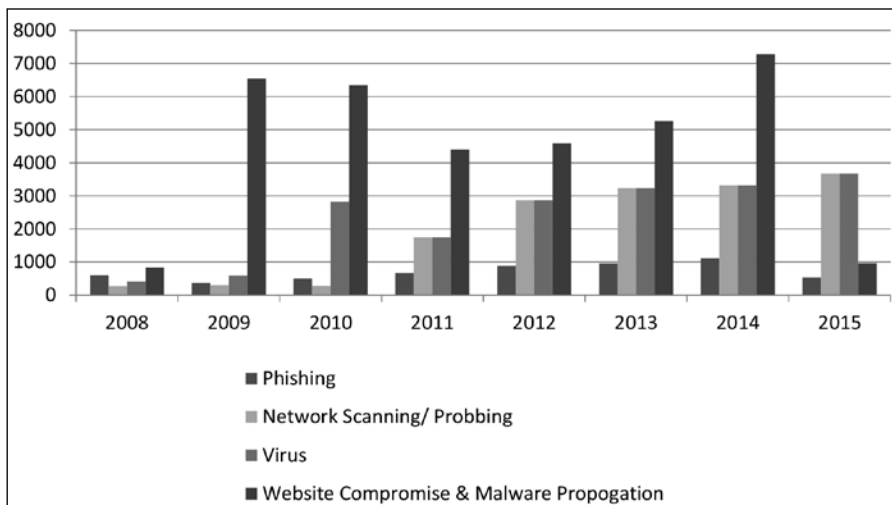
6. Sunil Mani, "India's Telecommunications Industry," available online at <http://www.nistads.res.in/indiasnt2008/t4industry/t4ind14.htm>. Accessed on May 19, 2017.

7. "History of Indian Telecommunication", 2011, available online at <https://telecomtalk.info/history-of-indian-telecommunication/67789/>. Accessed on May 19, 2017.

had a significant impact on the growth of the telecom sector in the country, along with an exaltation of the environment with fair competition and even the provision of safeguarding the consumers' interests. These efforts by the government, combined with the leapfrogging developments in cyber and mobile technologies, in turn, increased the number of internet users by nearly 70 times in the next 15 years.<sup>8</sup>

Over the years, even with a relatively low internet penetration rate, the internet user base in the country has grown enormously, and, today, India has the second largest number of internet users in the world, mainly owing to its humongous population. With this profile, there were instances where the nation was at the receiving end of cyber attacks. (Fig 1) The attacks were mostly in the form of breaches in data, phishing, trojan horse intrusions, organised cyber-related attacks, uncontrollable exploits such as computer worms or virus(es), malicious software code(s), malware attacks, websites being compromised, and so on.

**Fig. 1: Cyber Security Related Incidents Dealt with by CERT-In**



Source: Data compiled from CERT-In Annual Reports.

8. M.M. Chaturvedi, M.P.Gupta and Jaijit Bhattacharya, "Cyber Security Infrastructure in India: A Study", 2008, available online at [http://www.csi-sigegov.org/emerging\\_pdf/9\\_70-84.pdf](http://www.csi-sigegov.org/emerging_pdf/9_70-84.pdf), TDSAT, available online at [www.tdsat.nic.in/](http://www.tdsat.nic.in/). "Number of Internet Users - Internet Live Stats," available online at <http://.internetlivestats.com/>. Accessed on May 19, 2017.



In 2015, the cyber-related attacks generally increased, and were particularly related to threats from virus(es) and / or malicious code(s). The increasing number of attacks was largely due to the huge number of first time users in India. According to a report by Symantec, India is second in the list of countries targeted by cyber criminals.<sup>9</sup>

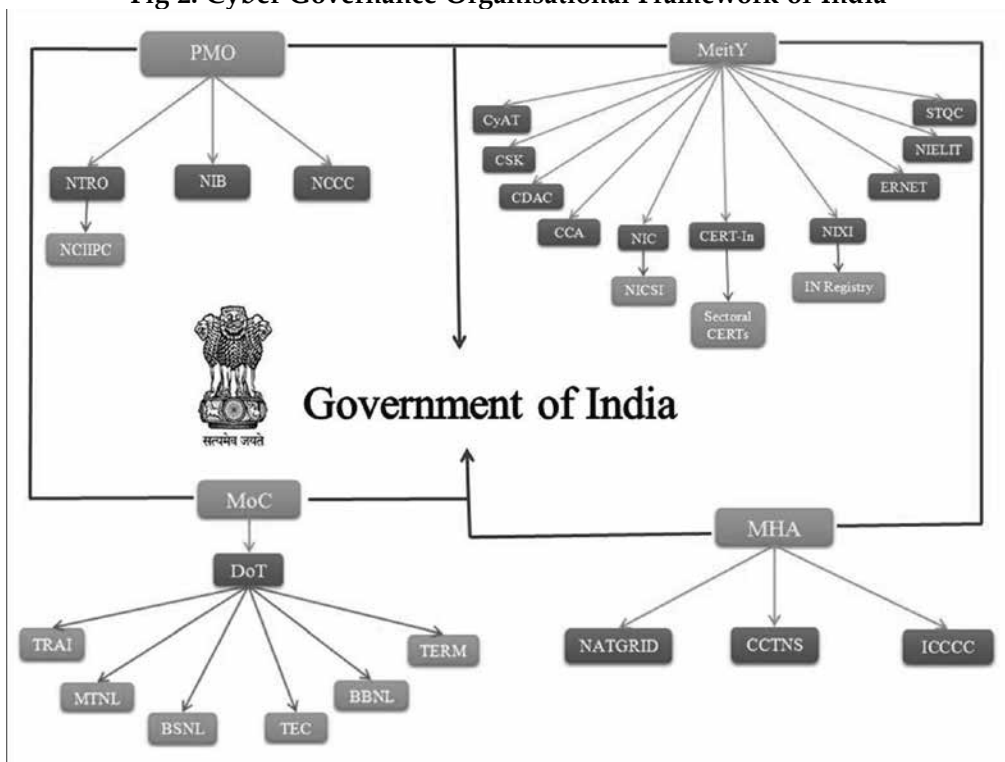
Owing to the widespread use of, and dependence on, cyber space in the country, India is one of the most targeted countries in the world for cyber attacks. The array of threats to India's cyber security includes data theft, malwares, hacking of sensitive networks, web defacements, identity thefts, online financial frauds, e-mail spoofing, social engineering scams, Denial of Service (DoS) and Distributed Denial of Service (DDoS) attacks, unauthorised access to the critical infrastructures of the country, online surveillance and digital espionage. Over the years, the cyber security agencies of the country have been on a mission to reduce the malware and website compromise attacks against the country's cyber assets by strengthening the cyber defence systems like firewalls and use of malware removal tools, in the government as well as the private sector. While many acts of web defacements emanate from unfriendly countries like Pakistan, unauthorised intrusions into sensitive Indian networks are emanating from countries like China, the USA, Pakistan and a few other countries. The fact that India was identified as the fifth most snooped country by the USA through its digital surveillance programme, PRISM, as revealed in mid-2013 by Edward Snowden, has brought to light the vulnerable condition of the country's cyber security framework and its related technologies. Various fatal malwares like Stuxnet, Duqu, Flame, etc. which have the capability to damage the critical infrastructures of the country have also been identified from different Indian networks. Additionally, the country's cyber assets are also vulnerable to the most recent form of ransomware attacks which have the ability to bring a country's cyber infrastructures to a standstill. Moreover, the potential of existing vulnerabilities in cyber space being exploited by violent non-state actors and various anti-social elements also poses a series of threats in this domain for the country.

---

9. "Internet Security Threat Report (ISTR)", *Symantec*, vol 22, available online at <https://www.symantec.com/security-center/threat-report>. Accessed on May 16, 2017.

The prevailing threat scenario described above clearly showcases the inability of the state to keep up with, or adapt to, the ever shifting technological developments and the increasing number of the emerging threat vectors exploiting the existing vulnerabilities and interconnectedness, mainly due to the lack of an all-inclusive governance architecture and practice. The huge size of India’s digital economy, the issue of it largely being unregulated is aggravating the challenge as far as governance of cyber space is concerned. While from a layman’s perspective it might seem that the country is without any cyber governance framework, on the contrary, the country has already set up a robust cyber space governance framework that is fully functional at all levels. Fig 2 is a pictorial representation of the cyber governance organisational framework of India in its current form.

**Fig 2: Cyber Governance Organisational Framework of India**



Source: Data compiled by the authors.

It is clear from Fig 2 that the structure of the cyber governance organisational framework in India is spread across various departments and organisations functioning under four ministries namely the Prime Minister's Office (PMO), Ministry of Electronics and Information Technology (MeitY), Ministry of Communication (MoC) and Ministry of Home Affairs (MHA).

The PMO is the highest decision-making body and is the ultimate authority with respect to governing, coordinating and supervising cyber space in India. Under the PMO, the prominent organisations that deal with governance in cyber space are the National Technical Research Organisation (NTRO); National Information Board (NIB) and National Cyber Coordination Centre (NCCC). The NCCC is an upcoming organisation aimed to emerge as an umbrella organisation coordinating all law enforcement agencies and defence groups, especially in beefing up the cyber security of the country. Its functions include filtering, coordination and maintaining communication metadata, intelligence gathering and information sharing activities with other agencies. The Computer Emergency Response Team-India (CERT-In) acts as the main agency for establishing and running the functions of NCCC.<sup>10</sup> The next agency, the National Technology Research Organisation (NTRO) was set up to provide technical cyber security and intelligence, while acting as a hub for supplying technical intelligence inputs as well as for providing coordination and coherence to existing information sharing mechanisms.<sup>11</sup> Another important organisation under the NTRO is the National Critical Information Infrastructure Protection Centre (NCIIPC). This organisation acts as the designated agency to facilitate protection of the Critical Information Infrastructure (CII), in gathering intelligence, as well as in extrapolating emerging and imminent threats in cyber space. It is entrusted with the role to collect, analyse and disseminate intelligence, with regard to enabling any inter as well as intra-organisational linkages to identify potential, existing and emerging threats.<sup>12</sup>

---

10. "National Cyber Coordination Centre (NCCC) of India May Become Functional", 2014, available online at <http://ptlb.in/csrdci/?p=259>. Accessed on May 14, 2017.

11. Sandeep Unnithan, "Spy versus Spy", 2007, available online at [http://indiatoday.intoday.in/content\\_mail.php?option=com\\_content&name=print&id=1067](http://indiatoday.intoday.in/content_mail.php?option=com_content&name=print&id=1067). Accessed on May 14, 2017.

12. Saikat Datta, "Defending India's Critical Information Infrastructure: A report", 2016, available online at <https://internetdemocracy.in/reports/india-nciipc-saikat-datta-2016/>. Accessed on May 14, 2017.

**The Ministry of Electronics and Information Technology (MeitY) works as an enabler in transforming the nation into a digital superpower, while empowering the citizens and creating a secure cyber space.**

The Ministry of Electronics and Information Technology (MeitY) works as an enabler in transforming the nation into a digital superpower, while empowering the citizens and creating a secure cyber space. It makes policies related to Information Technology (IT), the internet (other than licensing to internet service providers), promotes infrastructure creation for e-governance and helps in bringing initiatives to bridge the digital divide and promote standardisation, and the like.<sup>13</sup>

Many organisations operate under the MeitY.

These are the Indian Computer Emergency Response Team (ICERT/CERT-In); National Informatics Centre (NIC); Standardisation Testing and Quality Certification (STQC); Controller of Certifying Authorities (CCA); Cyber Appellate Tribunal (CyAT); Education and Research Network (ERNET); Cyber Swachhta Kendra (CSK) which is also known as the Botnet Cleaning and Malware Analysis Centre; National Internet Exchange of India (NIXI); Centre for Development of Advanced Computing (CDAC); and National Institute of Electronics and Information Technology (NIELIT). The .IN Registry comes under NIXI and it supplements NIXI's activities to provide inclusiveness in the cyber domain. The National Informatics Centre Services Inc (NICSI) comes under the NIC and helps in promoting, utilising and developing the spinoff of services, technologies, infrastructure and expertise. The Unique Identification Authority of India (UIDAI), which was established in 2016 under MeitY, is responsible for enrolment, authentication, operation and management for Aadhaar, issuing Aadhaar numbers, and in playing a prominent role in ensuring the security of the identity information, data and authentication records of individuals.<sup>14</sup> Among all the agencies that function under the MeitY, CERT-In gains more prominence as it is the national

---

13. "Ministry of Electronics and Information Technology (MeitY)", available online at <http://meity.gov.in/>. Accessed online on September 1, 2017.

14. "About UIDAI", available online at <https://uidai.gov.in/about-uidai/about-uidai.html>. Accessed on August 29, 2017.

agency in the area of cyber security that monitors, collects, analyses, coordinates and disseminates information. It also forecasts, warns or alerts of any incidents, attacks that are imminent. It issues guidelines, advisories, vulnerability notes and White Papers relating to information security practices, procedures, and prevention, response and reporting of cyber incidents, while taking exigency measures in emergency situations. This enables an information sharing ecosystem and helps coordinate the 'cyber warriors' as well as 'cyber builders' of the nation, who are considered to be the frontline defence mechanism against most cyber threats and attacks.<sup>15</sup> CERT-In also functions closely along with various sectoral CERTs for the prevention and mitigation of crises in various strategic and core sectors of the state.<sup>16</sup>

**The Ministry of Communication (MoC) plays a major role in providing services, issuing guidelines and taking necessary action with regard to infrastructure development for supporting the cyber space framework in the country.**

The Ministry of Communication (MoC) plays a major role in providing services, issuing guidelines and taking necessary action with regard to infrastructure development for supporting the cyber space framework in the country. Under the MoC operates the Department of Telecommunication (DoT) under which fall various organisations, companies and autonomous bodies. These include the Telecom Regulatory Authority of India (TRAI); Mahanagar Telephone Nigam Limited (MTNL); Bharat Sanchar Nigam Limited (BSNL); Telecommunication Engineering Centre (TEC); Bharat Broadband Network Limited (BBNL); and Telecom Enforcement Resource and Monitoring (TERM). The DoT mainly intends to coordinate the Internet Service Providers (ISPs) and other related service providers, with regard to cyber security incidents, responses, and taking the requisite actions, while providing guidelines regarding roles and responsibilities, for creating a resilient but reliable network, capable of providing uninterrupted coverage

---

15. "CERT India", available online at <http://cert-india.com/>. Accessed on May 18, 2017.

16. "Sectoral CERTs", available online at <http://pib.nic.in/newsite/PrintRelease.aspx?relid=112078>. Accessed on May 18, 2017.

with the aim to bridge the digital divide, while facilitating socio-economic development and growth, in the creation of a knowledge economy by increasing internet penetration through the provision of cost-effective but high quality broadband services to the people and the nation as a whole.<sup>17</sup>

The Ministry of Home Affairs (MHA) issues security guidelines, assists and sensitises other ministries, departments and critical sector organisations with regard to securing and protecting CIIs and strengthening security measures.<sup>18</sup> Under the MHA, the prominent organisations related to cyber governance are the National Intelligence Grid (NATGRID); Crime and Criminal Tracking Network and Systems (CCTNS); and Indian Cyber Crime Coordination Centre (ICCCC or I4C). NATGRID was conceived to create and broaden a cutting edge framework to augment India's capabilities in data linking, mining and analytics, issuing security guidelines for securing physical infrastructure, strengthening security measures and sensitising the administrative departments and organisations to vulnerabilities while assisting the corresponding ministry or department(s).<sup>19</sup> CCTNS focusses on modernising the law enforcement agencies, their functions, envisaging nation-wide networking, information sharing, providing citizens with interface to register complaints and avail of services, with particular focus on centralised planning and decentralised implementation.<sup>20</sup> Finally, I4C, set up in 2016, facilitates online reporting of cyber offences, apart from monitoring, analysing and countering 'new-age' cyber crimes by integrating around 15,000 police stations across the country, along with NATGRID. It is intended to strengthen the capabilities of existing organisations like CERT-In and Centre for Development of Advanced Computing (CDAC). It is intended to deal with issues like cyber theft, social media terrorism, related recruitment and cyber espionage.<sup>21</sup>

---

17. Discussion draft on National Cyber Security Policy, March 2011, Department of Information Technology, Ministry of Communications and Information Technology, Government of India, available online at <http://meity.gov.in>. Accessed on May 17, 2017.

18. Amitav Malik, "Role of Technology in International Affairs", Institute of Defence Studies and Analyses (New Delhi: Pentagon Press, 2016), p.157.

19. "Ministry of Home Affairs", in <http://mha.nic.in/>. Accessed on May 17, 2017.

20. "Welcome to CCTNS Citizen Portal - Tamil Nadu Police", available online at [www.eservices.tnpolice.gov.in](http://www.eservices.tnpolice.gov.in). Accessed on May 19, 2017.

21. Anurag Dwivedi, "Indian Cyber Crime Coordination Center (I4C): A Need to Relook?", 2016, available online at <http://usblog.in/2016/08/indian-cyber-crime-coordination-center-i4c-a-need-to-relook/>. Accessed on May 15, 2017.

### NEED TO IDENTIFY LOOPHOLES AND BRIDGE GAPS

During the immediate aftermath of the 9/11 attacks, Jacques Derrida, the French philosopher, opined that these attacks were part of the “archaic theatre of violence” of the real visible world, in which events are still to be conducted in a “clear and great order”.<sup>22</sup> With cyber space has ensued the emergence of vulnerabilities and an increasing number and variety of threats to the security of India and its people. According to reports by Norton in 2013, around 42 million cyber crimes happened every year in India, with more than 80 people being victimised by various forms of cyber attack every minute. This had an estimated economic burden of US \$8 billion for the nation, with the impact being extrapolated to incrementally rise in the future.<sup>23</sup> There has also been an increased number of attacks on India, by state and / or non-state actors, with about 50 percent of bot infected systems being tracked by CERT-In between the period 2013 to 2016.<sup>24</sup> In a 2012 report by Kaspersky, India was ranked ninth among the list of nations targeted in cyber space,<sup>25</sup> which was later raised to third place in its 2017 report.<sup>26</sup>

While the narrative in the previous section regarding the various ministries and departments that form the organisational governance of Indian cyber space gives a sense of security, the vulnerability prevailing in the Indian cyber space cannot be neglected. Therefore, there is a need to transcend the currently existing distinctive approaches by the ministries / departments / divisions, with overlapping responsibilities and activities, often leading to ineffectiveness in tackling and mitigating threats. The diverging visions, objectives, frameworks and rules often result in relatively

---

22. Yoram Schweitzer, Gabi Siboni and Eina Yogev, “Cyberspace and Terrorist Organisations”, *Military and Strategic Affairs*, vol. 3, no. 3, December 2011, p. 45.

23. Ten percent of all cyber crimes globally happen in India: Study, available online at [http://www.indiainfoline.com/article/news-top-story/10-of-all-cyber-crimes-globally-happen-in-india-study-113110815347\\_1.html](http://www.indiainfoline.com/article/news-top-story/10-of-all-cyber-crimes-globally-happen-in-india-study-113110815347_1.html). Accessed on August 28, 2017.

24. “CERT India”, available online at <http://cert-india.com/>. Accessed on May 18, 2017.

25. Y. Namestnikov and Denis Maslennikov, *Kaspersky Security Bulletin 2012*. The overall statistics for 2012, available online at <https://securelist.com/kaspersky-security-bulletin-2012-the-overall-statistics-for-2012/36703/>. Accessed on June 8, 2017

26. India Third Largest Spam Spewing Nation: Kaspersky Report”, 2017, available online at <http://www.bgr.in/news/india-third-largest-spam-spewing-nation-kaspersky-report/>. Accessed on June 5, 2017.

hindered coordination among different agencies. This can lead to the creation of gaps in effectively implementing policies, as well as in efficient functioning, which may (in the future) exacerbate any existing vulnerabilities in the cyber defence mechanisms as well as the measures in place.

In India, the NIC is mandated to manage the entire digital platform of the governmental organisation, with its own rules and regulations. But there is an extended list of organisations, bodies and projects like NCIIPC, NCCC, many of which are given prominent positions in the governance structure of cyber space. In many situations, the lack of effective coordination between these agencies in their activities causes hindrances in dealing with crises or bridging vulnerabilities on a pan-India level.<sup>27</sup> Even the effectiveness of NCCC in coherently engaging the intelligence agencies, industry private bodies and the different stakeholders, including the public is yet to be seen.<sup>28</sup> Both NTRO (NCIIPC comes under it), and NCCC are assigned the authority to protect the CIIs, but need to circumvent the problems that may arise, with regard to the challenges, divergences, efficient and effective information sharing, coordination and a coherent working structure in finding viable solutions. There are gaps in the information sharing mechanisms which can create hindrances in effectively dealing with the Critical Information Infrastructure Protection (CIIP) of the nation.

It is believed that NCCC can help address the threat perception to take a proactive approach in dealing with the complexities, and could emerge as more accountable, if not transparent, on a need-to-know basis. This facilitates the prevention, mitigation and prosecution of anti-state or anti-social elements, and bridges the gaps in governing the cyber space while enabling a responsible as well as effective type of governance.<sup>29</sup> Thus, there is a possibility of creating and developing tenable solutions to the issues pertaining to the security of the nation with regard to the present and future

---

27. Jonathan Diamond, "India's National Cyber Security Policy in Review", 2013, available online at <http://cis-india.org/internet-governance/blog/indias-national-cyber-security-policy-in-review>. Accessed on June 5, 2017.

28. n. 10.

29. Geetha Nandikotkur, "India Opens Cyber Coordination Centre", 2015, available online at <http://www.bankinfosecurity.in/india-opens-cyber-coordination-centre-a-8100>. Accessed on May 17, 2017.



cyber space domain. Concepts like data localisation, data sovereignty, and cyber sovereignty are becoming prominent issues in the international fora. In any case, there is a prerequisite for India to become a 'cyber power' in the future. This would not be possible without the minimum physical infrastructure and technological development in technologies like the Internet of Things (IoT), cloud computing facility, network stability, CII, and block chain.

There is also a need to open up more data centres like the Common Service Centres (CSCs) in India, which could act as enabling factors to accelerate cloud adoption in the government services, as well as in encouraging storage of data domestically. This can help address the issues of cross-border flux of data, with regard to licensing the cloud-based services, the distributed sovereignty of data storage, and for successful implementation of international best practices. This can also increase the interoperability, address the security of CII, bring in the element of standardisation of technical parameters (of cloud computing networks), incorporate and implement a legal as well as regulatory framework for domestic and international cloud services (jurisdictions and *dejurisdictionising* them), taking into consideration the interests of both the service providers and end users (cost-benefit analysis).<sup>30</sup> The CSCs can act as service delivery points in the rural areas of the country, acting as agents of change, promoting entrepreneurship, participatory and deliberative decision-making and capacity building, and, thereby, enabling a bottom-up approach. This can be supplemented by the establishment of a national nodal centre.<sup>31</sup>

Currently, in the I4C, there is a lack of inclusiveness in the deliberation, decision-making and implementing mechanisms. This affects the effectiveness of the measures being taken and their incorporation by different ministries, armed forces and other organisations. There are issues of overlapping and conflicting powers, functions, duties and responsibilities among I4C, CCTNS,

---

30. Telecom Regulatory Authority of India: Consultation Paper on Net Neutrality, January 4, 2017, available online at [http://traai.gov.in/sites/default/files/CP\\_NetNeutrality2017\\_01\\_04.pdf](http://traai.gov.in/sites/default/files/CP_NetNeutrality2017_01_04.pdf). Accessed on May 16, 2017.

31. Mansi Taneja, "NIELIT to Train Thousands of Cyber Security Professionals", 2011, available online at <http://www.infracircle.in/nielit-train-thousands-cyber-security-professionals/>. Accessed on May 16, 2017.

**In order to emerge as a cyber power, there is a need to institutionalise Research and Development (R&D) in developing (and implementing) high-end technologies like block chain, cloud computing, IoT and solutions for network security and stability.**

NTRO and NCCC. All of them are given 'variant' authority to monitor, regulate and provide security in cyber space, but are instead creating fissures, jurisdictional issues or even applying isolationist tendencies over the sphere of work. It would be desirable for all these agencies to be brought into a comprehensive framework, so that they can complement and supplement each other. There exists a possibility of cooperation, coordination and convergence that can create an enabling ecosystem to prioritise, not just the security of the nation, but also the privacy and security of the country's netizens as well. These

organisations could conduct a feasibility study on existing mechanisms and measures with regard to cyber resilience. In countering relevant threat perceptions, there should also be a technical capacity building mechanism at the pan-India level (on content monitoring) on the lines of the Network Traffic Analysis (NETRA) programme, which is currently under the Defence Research and Development Organisation (DRDO). But this should be balanced with the issue of the privacy of the citizens, and be in compliance with the accepted norm(s), legislative mechanism(s) and legal conditions judgement(s) in place.

Moreover, in order to emerge as a cyber power, there is a need to institutionalise Research and Development (R&D) in developing (and implementing) high-end technologies like block chain, cloud computing, IoT and solutions for network security and stability. Implementing indigenous technologies can help secure the country's system from external attacks, especially on critical infrastructure, while providing real-time access to information for the relevant stakeholders. There is also a need for expansion in activities related to development of infrastructure and indigenous technology, in the form of clusters or Software Technology Parks (STPs) and Innovation Centres in different parts of the country so as to foster innovative, creative and decentralised development of technology

and security mechanisms. Currently, CDAC develops technolog(ies) related to supercomputing and cloud computing.<sup>32</sup> There is a need to interlink STPs, clusters and the Innovation Centres with CDAC, CSCs, NIC and ERNET, which can help accelerate the creation of infrastructure, connectivity, new technologies for data localisation, efficiency, capacity building and performance augmentation of the system in a decentralised fashion. This cluster should be interfaced and interlinked with the academia, government and industry, so as to enable an ecosystem that isn't redundant or defunct in terms

of the contemporary technological developments or in dealing with threats emerging in relation to cyber space. The funding should be organised in the form of habitus of agencies or bodies that include members from the various sectors. The suggestions made so far, if implemented, could lead to the possibility of creating a second-strike capability for India, and possibly achieving cyber deterrence, at least among state actors.

Also, on the cyber crime front, there is a low conviction rate in the country which is a major concern, amounting to just 234 convictions for 3,206 cases that were chargesheeted in 2015. The conviction rate was reduced to one-third in 2016, with many arguing about the relatively ignorant attitude of some of the officials or judicial officers in matters of adjudicating powers or veracity of digital evidence (in the aftermath of covering up of tracks by perpetrators).<sup>33</sup> There is a need to address the shortage of skilled personnel and judicial officers, as India lags far behind other nations in effectively

**On the cyber crime front, there is a low conviction rate in the country which is a major concern, amounting to just 234 convictions for 3,206 cases that were chargesheeted in 2015. There is a need to address the shortage of skilled personnel and judicial officers, as India lags far behind other nations in effectively adjudicating, and arbitrating in, such cases.**

---

32. "Centre for Development of Advanced Computing (C-DAC)", available online at <https://cdac.in/>. Accessed on May 18, 2017.

33. A. Saikia, "Why Most Cybercrimes in India Don't End in Conviction", available online at <http://www.livemint.com/Home-Page/6Tzx7n4mD1vpyQCOfATbxO/Why-most-cyber-crimes-in-India-dont-end-in-conviction.html>. Accessed on June 8, 2017.

adjudicating, and arbitrating in, such cases. In the virtual world, it is being said that attacks can take place at the speed of light<sup>34</sup> and, thus, the existing legislations, namely, Telecom Regulatory Authority of India (TRAI) Act (1997), Information Technology (IT) Act ( 2000), Information Technology Amendments Acts (2008) and / or the National Cyber Security Policy (NCSP) ( 2013) have to be supplemented, if not complemented, by effective mechanisms to deal with matters in real-time.

There is a need to impart digital/cyber literacy and related high quality skills to the country's population. This issue gets exacerbated, especially due to the higher number of people lacking digital literacy, and, thereby, increasing the vulnerability, particularly in times of crises. The need to impart that kind of knowledge requires more trained professionals, teachers, infrastructure and, thus, more funding. There is also a need to tap the human resources in the country, especially when India has one of the largest cross-sections of youth in the world in terms of the demographic dividend.

The government has initiated the ISEA (Information Security Education and Awareness) project for developing human resources in the fields of data protection, and information security awareness generation, apart from offering courses like B.Tech, M.Tech and Ph.D in computer science in various universities and colleges across the country. A number of courses related to cyber security have also been initiated by the National Skill Development Agency (NSDA). Further, the government has set up the R.C. Bose Centre for Cryptology and Information Security with the aim to enable research, training, development and teaching in the field of cryptology and cyber security.<sup>35</sup> The universities and institutions should give more importance to skill-sets rather than just producing degrees or credentials. This can be given emphasis during the recruitment process, and can even help to reduce the brain-drain to a great extent. BSNL is said to have initiated the development of cities, interlinking it to cyber physical systems, and use of cloud computing for localisation and storage of data in cooperation with MTNL and BBNL for facilitating the requisite infrastructure facilities, especially the CII and its

---

34. S. Kumar, ed., *India's National Security: Annual Review 2013* (New Delhi: Routledge, 2014), p.60.

35. "Cyber Security Violations", Press Information Bureau, 2014, available online at <http://pib.nic.in/newsite/PrintRelease.aspx?relid=112078>. Accessed on May 16, 2017.

protection. It also intends to start a technical university, which, along with the Standardisation, Testing and Quality Certification (STQC) Directorate of the Meity, can develop and train proficient, skilled and adept personnel while improving the human resource capital and skilled professionals in the country.<sup>36</sup>

According to a few sources, in 2013, India's cyber security manpower numbered only around 556, which is miniscule in comparison to 1.25 lakh in China, 91,080 in the US and 7,300 in Russia.<sup>37</sup> Due to the increasing number of internet users in the country, probably larger than the total population of a few countries in Europe, the existing cyber infrastructure as well as the related institutions in India are facing increasing 'stress' in implementing state-of-the-art measures, mechanisms and programmes. This can possibly delay the elevation of India as a 'digital power'. The National Cyber Security Policy 2013 (NCSP 2013) of the Government of India estimates that an additional 5 lakh skilled professionals are needed to protect India's cyber frontiers.<sup>38</sup> According to the report by the Central Statistical Office (CSO), the shortfall of cyber personnel could result in an increasing number of conflicts, litigations and issues with regard to cyber space. There are innovative ways to find skilled hackers and cyber security experts, such as conducting information security competitions like Capture the Flag (CTF), hacking exercises, cross-domain efforts for collaboration among companies to get experts on deputation, and so on. Such efforts have been tried and tested successfully in countries like the USA, Israel, China and Japan, which claim to have in place resilient cyber defence systems; it will require political will and support from the highest level possible for such an effort to succeed in India.<sup>39</sup> The issue can, to a great extent, be dealt with effectively by restructuring the recruitment process(es)

---

36. "BSNL to set up Technical University for Engineering and Management Courses", 2014, available online at <http://indiatoday.intoday.in/education/story/bsnl-to-set-up-technical-university/1/355586.html>. Accessed on June 8, 2017.

37. S. Joshi, "An IT Superpower, India has Just 556 Cyber Security Experts", 2013, available online at <http://www.thehindu.com/news/national/an-it-superpower-india-has-just-556-cyber-security-experts/article4827644.ece>. Accessed on June 8, 2017.

38. "National Cyber Security Policy (NCSP 2013)", available online at <http://meity.gov.in/content/national-cyber-security-policy-2013-1>. Accessed on June 5, 2017.

39. E. Dilipraj, *Cyber Enigma: Unravelling The Terrors in the Cyber World* (New Delhi: KW Publishers, 2017), pp. 212-225.

**The country needs to invest in infrastructure development, instituting effective regulatory mechanisms and security measures, particularly in dealing with the protection of CIIs in its domestic environment.**

as well as streamlining the existing training programmes in an effective manner. An assemblage of a skilled but coordinated 'cyber army' for the nation can effectively match the force projected by the likes of China, the US and even other major non-state actors such as Google and Facebook.

The current reliance on public sector R&D has not, in the larger context, entailed the creation of an innovative environment in India that can efficiently upgrade, depending upon the increasing complexity of challenges. While India has accepted the populist approach of multi-stakeholderism when it comes to global internet governance, by including the private stakeholders, non-governmental actors and civil society, the country needs to invest in infrastructure development, instituting effective regulatory mechanisms and security measures, particularly in dealing with the protection of CIIs in its domestic environment.

Currently, the focus on R&D could be need-oriented, and Public-Private Partnerships (PPP) in each sector need to be identified. India has already set up Information Sharing and Analysis Centres (ISACs) for information sharing and exchange on cyber incidents in the financial sector, and for entailing advice in taking appropriate steps and measures in mitigating crises. But the necessary steps should also be undertaken to set up similar ISACs in the petroleum and power sectors in a mission mode.<sup>40</sup>

Lastly, there is a need to take a proactive approach in terms of legislations (both domestic and international), and for implementing effective mechanisms on the ground. There is also a need for modernising the forces (in the cyber realm) with regards to their technical and legal capabilities, particularly in the form of a cyber police force, that can manage, coordinate and implement effectively the different norms and provisions that exist, as well as provide, enable, supplement, optimise and incorporate the use of international best practices with regard to India. There is also a need to undertake urgent steps

---

40. n. 35.

to categorically implement the cyber security strategies in the short term (1-3 years), medium term (3-5 years) and long term (5-15 years) periods.

## CONCLUSION

The domain of cyber space is sometimes perceived to be an unregulated and chaotic spatial paradigm which is devoid of any politico-physical boundaries or demarcations. This could possibly create a kind of overlapping, confusion and / or issues within or between the organisations and ministry(ies). But a form of distinct centralised institutional governance on a distinct plane cannot exist, particularly because of the inherent nature of cyber space that transcends all boundaries or delineations existing in the physical world. The threats in cyber space will evolve in new forms with the emergence of the Internet of Things (IoT), cyber physical systems, cloud computing and other future technologies. In developing countries like India, with a large number of users, any form of the conventional approach undertaken by the ministry(ies) or government organisation(s) to work within a particular sphere does not provide optimum results, particularly in the cyber domain where everybody and everything is interconnected, interrelated and interdependent. Rather, an efficient and effective inter-organisational or inter-ministerial coordination, approach or body is necessary. The ability and utility of the architectural framework of a nation depends on its organisations, their coherent nature and coordinated actions as well as activities. India should focus on the development of “core internet infrastructure”,<sup>41</sup> identify the existing and emerging complexities in cyber space and create new norms that can be set as international benchmarks. This is a prerequisite for creating as well as strengthening the effective governance of cyber space as well as developing the country into a ‘knowledge powerhouse’, which

**The threats in cyber space will evolve in new forms with the emergence of the Internet of Things (IoT), cyber physical systems, cloud computing and other future technologies.**

---

41. Indrani Bagchi, “India for Inclusive Internet Governance”, 2014, available online at <http://economictimes.indiatimes.com/tech/internet/India-for-inclusive-internet-governance/articleshow/34189920.cms>. Accessed on June 3, 2017.

would, in turn, help, create a dynamic, security-oriented but open cyber space, with a distinct focus on an ecosystem that enables innovation and investment.

The inherent nature of cyber space creates a kind of virtual world that is interconnected and interlinked, and, thus, is hard to be equated with the 'Westphalian' concept of sovereignty. But the disruptions created in cyber space can create a kind of ripple effect that would greatly influence almost every actor, state and non-state alike. Currently, with the increasing incidences of cyber threats and attacks on almost every digitally interconnected nation, there is a need to bring in effective solutions, of which an important component resides upon the effective institutionalisation of organisational governance as well as coordination and regulation of cyber space within the nation. In order to have a safe and secure cyber space, India must enhance its organisational governance structure that enables expeditious information sharing, coupled with the establishment of a coordinated response system capable of alleviating as well as mitigating any kind of possible impairment by the malignant activities of different actors in cyber space. This includes protection as well as preservation of CIIs, which will not only reduce the vulnerabilities of the system but, most importantly, help maintain integrity. This is a requirement for a safe and secure cyber space and is possible only through a combination of institutional structures, people, processes, technology and cooperation.



# OPERATION RAHAT: A TASK FORCE COMMANDER'S ACCOUNT

**RAJESH ISSER**

## **ABSTRACT**

*Disaster struck the state of Uttarakhand, larger than Switzerland and Belgium taken together, on June 16-17, 2013, with unprecedented heavy rains that caused flash floods and landslides. This tragedy of epic proportions left an estimated 6,000-7,000 people dead in its wake. Almost 4,000 villages were severely affected. At the end, more than 1,10,000 pilgrims had been evacuated, including about 45,000 by air. An additional 1,00,000 locals had been moved to safer places elsewhere in the state. All this was done in the most demanding terrain (the high Himalayas) and in the thick of the monsoon season. This personal account is about handling the complexities of mass evacuations, medical aid, and all the other issues involved.*

*Coordination amongst the various agencies, effective utilisation of all available resources, and common sense solutions were some of the highlights of the operation. The rescue and relief action saw a convergence of multiple and diverse organisations. Swift trust came through the established credibility and reputations of organisation, but a big contributor was the demonstrated performance of actors and individuals, as time went by. This allowed delineation of roles and responsibilities without a strict hierarchy. Shared goals and a common vision of an end-state allowed an environment that facilitated collaboration.*

---

Air Vice Marshal **Rajesh Isser**, AVSM VM, is Senior Officer-in-Charge Administration, Headquarter Central Air Command, India.

**At the end, more than 1,10,000 pilgrims had been evacuated, including about 45,000 by air. An additional 1,00,000 locals had been moved to safer places elsewhere in the state. All this was done in the most demanding terrain (the high Himalayas) and in the thick of the monsoon season.**

## INTRODUCTION

Disaster struck the state of Uttarakhand (India) on June 15, 2013, with unprecedented heavy rains throughout the night that caused flash floods and landslides. Water levels in all the rivers crossed the danger mark and at many bridges, and portions of roads were washed away (at 2,172 points), snapping road links to many places. This tragedy of epic proportions affected the entire state and some parts of adjoining Himachal Pradesh, leaving an estimated 7,000 people dead or missing in its wake. Almost 4,000 villages were severely affected. After two days of

initial operations and reconnaissance of the affected areas, when the skies stopped pouring, the full extent of the tragedy came to light. This led to the mounting of the biggest humanitarian operation in the history of the Indian Air Force (IAF): Operation Rahat. At the end, more than 1,10,000 pilgrims had been evacuated, including about 45,000 by air. An additional 1,00,000 locals had been moved to safer places elsewhere in the state. All this was done in the most demanding terrain (the high Himalayas) and in the thick of the monsoon season [see Fig 1(a) and Fig 1(b)].

We started operations with just two rooms at Jolly Grant (Dehradun): one operations room and one for the aircrew. The blackboard in the crew room, crammed as it was, provided the first display of the power of team work in the days to come. The signatures on it included those of pilots, engineers, doctors, paramedics and civil administrators who put all their professional acumen and selfless commitment on the line to pull off the most remarkable rescue and relief operations ever witnessed by the country and the world.

Fig 1(a)



Fig 1(b)



## THE DELUGE

**Ground Situation:** Heavy rains, flash floods and large scale landslides had occurred in various regions of Uttarakhand and eastern Himachal Pradesh. The most severely affected areas were Rudraprayag and Chamoli districts in Uttarakhand, with Kedarnath valley taking the brunt of the calamity, with 160 villages affected and almost all the major roads links snapped due to landslides. Many villages were washed away and many abandoned due to fear of landslides. There were reports of damage in the Kumaon region in Pithoragarh district. Snapping of road links not only resulted in tourists (mostly pilgrims), being stranded, but also shortage of food and medicine, and a total collapse of the public distribution system in the states. Thus, a major requirement of heli-dropping of rations came up along with casualty evacuation. In Himachal Pradesh, the Kinnaur and Rampur districts were badly affected. The roads from north of Rampur to Kaza were washed away in many places, leading to some casualties, stranding of tourists (foreign and Indian) and locals, and also severely affecting the supply of food and other essential items.

Fig 2(a)



Fig 2(b)



### KEDARNATH LAYOUT

The temple township of Kedarnath itself is located on glacial outwash deposits at an altitude of 3,581 m Above Mean Sea Level (AMSL). These deposits can be understood as being heaps of unconsolidated rock mass deposited by glaciers and later modified by the action of water. The shrine of Kedarnath was located on a raised middle portion of the deposit that was 20-25 m above the level of the Mandakini at 3,562 m AMSL [Fig 2(a) and Fig 2(b)]. For reaching Kedarnath, one had to trek upstream along the course of the Mandakini from Gaurikund for a distance of 14 km.

A moraine dammed lake, Chorabari Tal, was present a little downstream of the snout of Chorabari glacier. This lake was located in the depression formed in the glacial material to the west of the right lateral moraine of Chorabari glacier and was fed by seepage of the glacial melt water. Even though the depression was around 200 m long, 100 m wide and 15-20 m deep, not more than 2-3 m water used to be there in the lake. There were incessant rains in the area between June 14 and 17, 2013, and rainfall on June 16 and 17, 2013, was particularly heavy (see Table 1).

Tragedy struck Kedarnath on the night of June 16, 2013, and in the morning hours of June 17, 2013. The hitherto abandoned eastern channel of the Mandakini at Kedarnath became active in the evening hours of June 16, 2013. Flooding in Kedarnath was not that devastating on June 16, 2013, though it washed off the pedestrian bridges over the Mandakini connecting Kedarnath to Rambara and turning Kedarnath into an island, but the flood

waters of the Mandakini did not affect the Kedarnath temple premises.

On June 16, 2013, after the flood event, despite heavy rains, most people in Kedarnath assembled in the temple premises and engaged in prayers. A large number of people, however, returned to their respective homes around 0200 hrs, and major devastation took place in Kedarnath in the morning hours of June 17, 2013; Chorabari Tal was intact on June 16, 2013. Rambara and Gaurikund were devastated in the night of June 16, 2013. The

breach of Chorabari Tal took place around 0700 hrs on June 17, 2013, and the flood waters of the Mandakini ravaged Kedarnath completely, and Rambara, Gaurikund and Sonprayag again in the morning hours of June 17, 2013.

**The breach of Chorabari Tal took place around 0700 hrs on June 17, 2013, and the flood waters of the Mandakini ravaged Kedarnath completely, and Rambara, Gaurikund and Sonprayag again in the morning hours of June 17, 2013.**

**Table 1**

Date	Rainfall ( in mm)		Level of the Mandakini at Rudraprayag (in m/ AMSL)	
	At Rudraprayag	At Gaurikund	Danger Level	Level at 0800 hrs
June 15, 2013	41.4	250.0	626.00	618.12
June 16	105.2	+250.0	626.00	625.00
June 17	100.2	180.0	626.00	633.50
June 18	62.1	0.0	626.00	626.65
June 19	7.0	0.0	626.00	623.00
June 20	0.0	0.0	626.00	622.48

The volume of water was enormous and carried with it huge glacial boulders and outwash materials that choked the western channel of the Mandakini, and the flow of water and debris got diverted towards Kedarnath township that was, thus, ravaged. There was absolutely no warning: most people were taken by surprise and had no time to respond. Besides Kedarnath, this event caused devastation in Rambara, Gaurikund, Sonprayag and other places.

**All communication with Kedarnath valley was snapped in the late evening of June 16, 2013. Adverse weather and terrain conditions prevented any resort to alternative probes. The outside world as also the local administration, therefore, remained unaware of the events in Mandakini valley till the afternoon of June 17, 2013.**

also the local administration, therefore, remained unaware of the events in Mandakini valley till the afternoon of June 17, 2013.

A before-and-after comparison in some of the figures (above and below) clearly shows the extent of devastation [Fig 2(a) and Fig 2(b)]. Today, even the temple lists to one side, an indication of the beating it took during the morning of June 17, 2013. The towering temple structure, standing a clear 25-30 ft or more above the ground, now has the ground (rubble) level in line with the main doorway. The entire market place and steps have all been buried. Eye-witness accounts say that about 500 people had congregated at the complex on the night of June 16, 2013 (50 in the temple and others outside). By the morning of June 17, only the 50 in the temple survived by clutching onto various objects inside while it got flooded and rammed by large boulders from all sides.

**Rambara: Most Critical:** The aerial pictures of the before and after state reveal the complete devastation. An estimate puts it at about 1,500-2,000 people killed in and around Rambara at any given time. On June 16, the first deluge, caused by the giving away of the barrier formed by the debris brought down by the Dudh-Ganga river, occurred; and the momentum provided by a steep gradient, almost like a waterfall, completely gorged out Rambara. The

The sequence of events in the Mandakini valley took everyone by surprise—no one really got the chance of raising an alarm of any sort. Attempts were made to communicate the news of flooding over the high frequency police radio set but the seriousness of the event could not be assessed from the hurriedly communicated incomplete messages. All communication with Kedarnath valley was snapped in the late evening of June 16, 2013. Adverse weather and terrain conditions prevented any resort to alternative probes. The outside world as

next set of pictures [Fig 3(a) and Fig 3(b)] show a part of Rambara before and after. Bodies of people and animals, together with the remnants of the township show the ferocity of nature. Into this cauldron, the gallant aircrew of the IAF flying their Advanced Light Helicopters (ALH) performed the first rescues on June 18.

**Fig 3(a)**



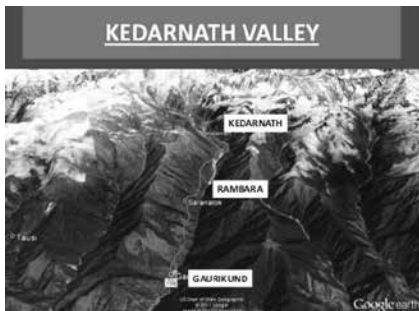
**Fig 3(b)**



A special mention needs to be made of Wg Cdr Sachin, who was the first to venture in, and without the possibility of landing, picked up the first most critical cases. That started the massive operations to pick up thousands of critical cases from Rambara, Gaurikund and Jungle Chatti. **What follows is an excerpted personal account:** After entering the valley, we flew following the valley at a safe height, but above the obstructions. The track was broken at various places, starting from the valley entry from Sonprayag till well short of Kedarnath shrine, including various places around Gaurikund and Rambada. There was no prominent site close to the track to land because of the tall vegetation and the presence of low tension electrical lines. We established hover clear of the trees and electric poles, and dropped food packets and water bottles. Due to the impact after the drop from such height, most of the dropped items were damaged. Thereafter, we carried out a recce of the area more thoroughly and spotted an area adequate for the ALH to fit in. This area was close to the Rambara village and was adequate to fit an ALH with one skid [Fig 4(a) and Fig 4(b)]. We utilised this spot to pick up survivors by maintaining low hover at 1-2 ft. This location was subsequently

made known to the other ALH and civil helicopters. In the first sortie, we carried out 4 shuttles and evacuated 32 people, and dropped 350 kg of food items. Post turn-around servicing, we resumed our rescue operations in the Kedar valley. Ahead of Gaurikund, we spotted another adequate landing site supported by a huge flat stone which was close to the track and just on the edge of the river Mandakini. There were a few loose tarpaulin sheets and jute bags which started flying due to the downwash of the aircraft. So we dropped our gunner to ask the people nearby to clear out the area. After clearing the area, the spot was utilised subsequently for the evacuation of people. By the end of the day, we had evacuated 42 people and dropped 900 kg of load at various places in the Kedar valley.

**Fig 4(a)**



**Fig 4(b)**



### **DEATH VALLEY**

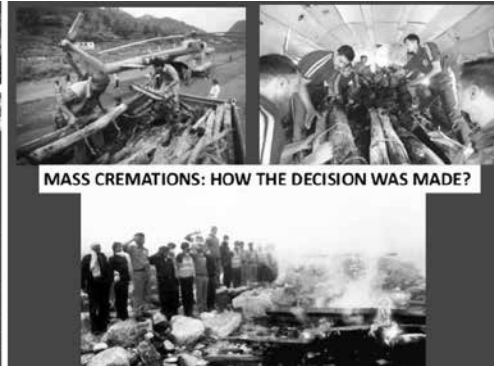
All along the 14 km route from Gaurikund to Kedarnath, dead bodies were testimony to the violent forces unleashed by nature. It was clear that warnings, if any, had been minimal. Many pilgrims, especially the old or medical cases, lay dead along the path. It was an eerie sight to see the living sticking to their dead loved ones even in an advanced stage of decomposition. The stench was palpable even when flying in the valley.



Fig 5(a)



Fig 5(b)



**Mass Cremations:** With the IAF's experience in Humanitarian Assistance and Disaster Relief (HADR), I was clear on June 19 itself that the number of dead would touch 5,000-7,000, while most, including the state government and army, maintained that it would not cross even 50-100. The home minister was advised against mass cremations, while I was the only voice that argued for the same. I reiterated that it was not possible to preserve even one body under the circumstances. Finally, prudence prevailed and mass cremations, after DNA sampling and photographs, was ordered by the Government of India [Fig 5(a) and Fig 5(b)]. Today, the actual estimates are closer to 7,000 dead or missing, discounting more unregistered poor people or beggars.

#### MISSION STATEMENT

The mission statement was: **To rescue all pilgrims and locals from the affected areas in order of priority determined by life-criticality, age/gender vulnerability and location in the shortest possible time.** I had given my assessment in the core-group meeting as eight clear-weather days, however, the Government of India's informal assessment was up to two months. Despite bad and intermittent good weather days, the main evacuation of critical pilgrims (19,600) was done in just 12 days.

Fig 6



## OPERATIONS

The three real considerations were time, terrain and weather: all of which affected, together or singly, the mission statement (Fig 6).

**Time/Terrain/Weather:** This was of essence since thousands of critical cases were involved. In general, these comprised old people, mostly suffering from various medical ailments. People ran out of medicines, as also some cardiac cases turned critical due to stress and the inhospitable environment. To cut down on time, forward basing of operations was the key. It depended on fuel being positioned at the forward locations. Since most roads were washed away, the state government could only position this after 3-5 days. Overnight, the Mi-26 heavy lift helicopter was used to position fuel bowsers at Dharasu (Gangotri valley) and Gauchar (Kedarnath) (see Fig 1(b)). The C-130 defuelled its fuel into bowsers at Dharasu. The more critical case of Gauchar was addressed by hundreds of barrels of fuel positioned by the Mi-26 directly from Chandigarh. This contribution of the IAF that ensured the operations of all IAF, civil and army helicopters on June 19, 20 and 21, truly saved thousands of lives.

Rules had to be waived off by the minute. The Chief of the Air Staff (CAS) had allowed me to professionally vet, and waive, rules. For example, no flying is allowed in the mountains beyond one hour before sunset; however, the windows of opportunity in Kedarnath valley were present only in the dying hours of the day. Considering the experience of the pilots, the maturity

of the supervisors, familiarisation in the sector and other such factors, on the critical dates of June 19-23, I allowed operations till sunset and, sometimes, on a case-to-case basis, beyond that. The IAF's herculean effort in getting the grounded Mi-26 (the world's largest helicopter) flying in record time was truly a great enabler.

## CONOPS

Fig 7(a)



Fig 7(b)



The 'Concept of Operations' or CONOPS revolved around centralised planning, monitoring, tracking and coordinating with all the agencies. However, decentralised execution and evacuation ensured that no time was lost. I was in regular touch with all the detachment commanders and even individual captains, especially at the start and end of flying activity. All special missions and waiver of rules were done explicitly by me [Fig 7(a) and Fig 7(b)]. Tracking was done through every possible means; mobiles, High Fidelity, Very High Fidelity, Very Small Aperture Terminal (HF, VHF, VSAT) and police wireless nets, etc.

As seen above in the forward-basing plan, while the five major hubs with reasonably operational infrastructure remained constant, further sub-nodes kept getting added or subtracted as detachments, depending on the assessed requirements. Some of the sub-nodes are depicted above. The continuous flow of orders, directions and information flowed from the Task Force Command (TFC); while, at the same time, modifications and changes in plans were completely dependent on the reverse flow of feedback. For example,

**As the month of July began, the need to relocate thousands of locals and to replace hundreds of National Disaster Response Force (NDRF) and Indo-Tibetan Border Police (ITBP) personnel, state government officials, police, etc took primacy. Coordination of a very high order was required with all the agencies to effect an optimum air movement plan.**

the focus on building a clearing at Jungle Chatti on a war-footing was based on a correct assessment by an IAF ALH pilot who was operating in a winching mode there.

#### **TARMAC/ TRANSIT MANAGEMENT**

Thousands of pilgrims passed through all the major hubs; on June 23, some 4,500 evacuations were carried out. These were the IAF figures—a few hundred were added by civilian helicopters. Managing this stream of people, some seriously injured, required innovative local Standard Operating Procedures (SOPs); and the help of all uniformed personnel and disciplined volunteers [Fig 8(a) and Fig 8(b)]. After a few days, the SOPs got honed to a very fine level. As the month of July began, the need to relocate thousands of locals and to replace hundreds of National Disaster Response Force (NDRF) and Indo-Tibetan Border Police (ITBP) personnel, state government officials, police, etc took primacy. Coordination of a very high order was required with all the agencies to effect an optimum air movement plan.

**Fig 8(a)**



**Fig 8(b)**

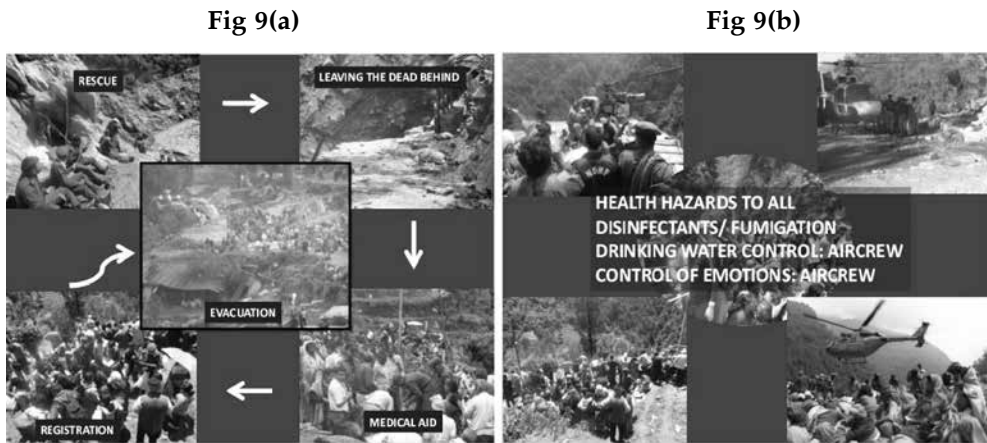


**SYNERGY IN RESCUE OPERATIONS**

Since Kedarnath valley was the only life-and-death critical case, the focus was on picking up survivors from there. A grand plan was offered by the IAF in the presence of the union home secretary, chief minister, cabinet members and the chief secretary. It was explained that if the helicopters were to evacuate all the way to Dehradun, precious time would be lost and lives would be at stake. An alternate route from Guptkashi–Mayali–Tehri–Rishikesh was reconnoitred by me on June 19. The same was activated by the orders of the central government with immediate effect. It could support only light vehicles, and, therefore, these were requisitioned in the hundreds. On June 20, a convoy of more than 500 light vehicles moved on the road to ensure speedy evacuation. All along, food, and medical and psychiatric help were arranged in the form of transit camps. The most severe cases were taken by the Mi-17s to Jolly Grant directly. Similar models were suggested for all the valleys affected in Uttrakhand and Himachal Pradesh, and were activated on June 20 itself by the orders of the central government.

The front end of the rescue was picking up the injured and survivors from remote and inaccessible places in the deep and narrow valleys. The first step was to place specialist troops such as the NDRF, ITBP and, later, army paratroopers, by winching them down. They had a two-fold task: firstly, to make clearings for the helicopters to land; and secondly, to find, and help, survivors to reach the pick-up point [Fig 9(a) and Fig(b)].

**On June 20, a convoy of more than 500 light vehicles moved on the road to ensure speedy evacuation. All along, food, and medical and psychiatric help were arranged in the form of transit camps. The most severe cases were taken by the Mi-17s to Jolly Grant directly.**



Since the dead and living were together in these places, it was quite a task to convince the living to leave their loved ones (dead) behind. Heart rending tales in the hundreds were witnessed by the rescuers. After evacuation, immediate medical aid was administered in various degrees, including resuscitation and emergency medical procedures. Teams of specialist doctors had already been positioned at all the sub and main nodes. Severe cases were marked for air evacuation while the rest, after registration, were moved by convoys. Satellite phones were installed so that people could talk to their relatives. This entire synergised effort was the real reason of the success of Operation Rahat's relief and rescue phase. All the helicopters, while going in for rescue, carried relief rations and bottled water to be dropped at various places.

#### **HEALTH HAZARDS: GROUND ZERO, GAURIKUND TO RAMBARA**

While all the valleys had problems of overcrowding, lack of infrastructure, shortage of medicines and doctors and an unhygienic environment all around, the Rambara-Gaurikund area was the worst affected [Fig 9(a) and Fig 9(b)]. By June 22, the stench of dead bodies and animals had grown so strong that it could be discerned in a helicopter while hovering. Cases of diarrhoea, poisoning and other ailments were common. Special precautions were taken in disinfecting the helicopters and personnel regularly. In the case of death onboard or dead bodies, fumigation for

the night was mandatory. Aircrews were forbidden to drink any water except bottled mineral water directly supplied by the task force at Jolly Grant. All detachment commanders were directed to keep a strict vigil on food supplied by the civil agencies. A larger issue was the emotional counselling of the aircrew so that they did not get carried away and cross limits. Also, beyond a certain duration of operating in, and among, the dead and injured, the stress cases were moved out to more benign operations. A case in point was an ALH crew that had done some severe stressful work in Jungle Chatti and beyond. They were moved out to Dharasu after four days of hectic operations.

### **GROUND(ED) PROBLEMS**

Ground management of panic-stricken and injured people, many of whom had lost many, if not all, of their family members, was a nightmare. Fig 10(a) and Fig 10(b) below show an IAF pilot who had to switch off because of being completely overwhelmed by hundreds of people. He borrowed a loud hailer from the police, and only after an hour of cajoling, was able to pacify the panicked crowd. Later on, there were many cases of pony-wallas blocking helipads to coerce the state government to stop using helicopters. Stone-throwing incidents in Pithoragarh district were rampant till I personally took up the matter with chief minister and chief secretary. In most cases, the aircrew briefed NDRF/ITBP/police personnel individually about the SOP to be followed. The Director General (DG) of Police of Uttarakhand had a long meeting with me on this and other police related issues on the June 25. After this, problems of such nature subsided. There were many psychiatric and trauma related cases on the ground that could be a hazard to a helicopter.

Fig 10(a)

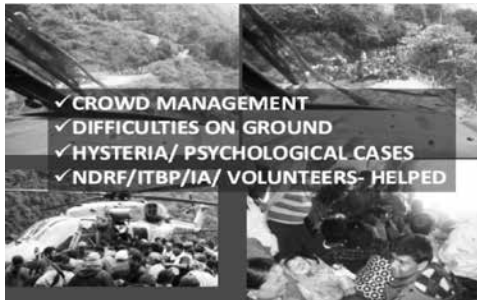


Fig 10(b)



### PRIORITISATION

The state administration had very little in terms of assessments from the ground viz District Magistrates (DMs), tehsildars, Sub-Divisional Magistrates (SDMs), etc. After my recce with the union home secretary, DG Border Roads, DG ITBP, DG NDRF on June 19, I got in touch with the DMs of Uttarkashi, Rudraprayag, Chamoli and Pithoragarh for ground reports. Unfortunately, no holistic reports or credible assessments were available. In fact, the DM of the most critical Rudraprayag district had suffered a heart attack and the new incumbent was at a complete loss. A rough plan of relief drops was undertaken immediately. Over the next two days, based on pilot reports and survivor accounts, a mosaic of priority areas was prepared. Based on this, relief, medicines, doctors, policemen, civil servants were heli-dropped as part of the evacuation plan. All the DMs and the commissioner of Kumaon were in daily touch with me and the Disaster Centre for their requirements. This was vetted in the evening by me with Mr Umakant Pawar, secretary to the state government, as the state representative. However, the trust reposed by the state on the IAF was so great that all final decisions of prioritisation were left to the IAF. Sortie planning had to factor in alternate sites/ missions so that there was a minimum number of complete aborts or Did Not Check Outs (DNCOs). Any major hiccups or changes to a plan were immediately informed to me by the detachment commanders. They were given enough freedom to react to situations and pass the information later on to me.



### **PRESSURES FOR PRIORITISATION**

As expected, with people from all states of India involved, anxiety manifested in thousands of telephone calls and messages (SMS) asking for the rescue of particular persons or groups. There were calls from high political offices, senior bureaucrats, generals, admirals, air marshals and others, with frantic requests. But we held our ground on a matter of a simple principle: **priority was in the sequence of injured/ critical, old, women and children and, lastly, able-bodied men.** Every feedback to us praised our completely unbiased stand, unlike the civil helicopters whose operations were run with some nefarious agendas. My simple refrain to everyone was: **we will rescue or evacuate all; that is the commitment of our chief.**

### **FORMULATION OF PROCEDURES**

As most of the aircrew were either not current in, or were new to, operations in these mountains, alongwith the large number of obstructions, the pattern of weather and turbulence, the presence of other helicopters (civil) operating in the same valleys and operating with civil agencies on the ground that were not familiar with helicopter operations, certain procedures were evolved to ensure safe and optimal utilisation of the available effort. These were as follows:

- All helicopters maintained an open valley frequency.
- All take-offs were staggered. All helicopters maintained right of the valley. Inbound and outbound heights were specified for each valley. For example, a unique procedure was adopted in Harsil. The stretch of the valley spanning 9 Nautical Miles (NM) to 5 NM, inbound Harsil is a very narrow one. It was named "narrow valley" for ease of understanding by all the aircrew and specific Radio/Telephony (R/T) calls were to be made while entering and exiting the narrow valley. The minimum height to be maintained to cross this narrow valley for the Mi-17 V5 was 2,500 m and the level to be maintained was positively below the cloud base. Also, all traffic was to be maintained in the centre of the narrow valley. In the case of two aircraft operating at the same time, vertical separation was to be maintained after an announcement on R/T. No pressure of any kind was

imposed upon the pilots in the execution of any task. All the captains had the full authority to abort any sortie for any reason of safety.

- All maps were updated for obstructions and this was personally supervised by me.
- Minimum descent heights were specified for each valley. Descent was carried out only when in contact with the destination helipad, and clear of obstructions.
- Morning briefings were carried out regularly, reiterating adherence to SOPs and flight safety as paramount. Weather reports were obtained from nearby air force bases. Additionally, satellite pictures were downloaded from the internet. Also, a system of obtaining weather reports from the NDRF and police on wireless nets was evolved. Gram pradhans of villages enroute at critical locations also provided weather reports. This was of great assistance whenever there was a rapid deterioration of weather. Pilots were warned well in advance, which enabled timely safe decisions.
- Availability of the mobile network was explored to improve safety and efficiency. The establishment of real time communication with the crew of different helicopters was ensured by a system of SMS on mobiles using 'Whatsapp'. This enhanced the safety, especially in fast deteriorating weather. On many occasions, it allowed timely diversion or holding on forward helipads rather than getting into bad weather.
- In addition to the IAF helipad directories, directories were also taken from the state government and matched for any variations.
- All aircrew and technicians were briefed on controlling the movement of vehicles. Only authorised vehicles were permitted on the helipad, under the direct control of IAF personnel.

**Execution of Relief Operations:** The relief operations were executed as follows:

- The civil aviation authorities, after consultation with me, planned sorties as per the requirement of the state government. A daily flying programme, giving tasking in terms of sorties to specific locations, was

prepared at Jolly Grant.

- Initial sorties were planned to helipads at higher elevation, especially prone to severe air turbulence.
- The priority was to induct the NDRF and evacuate the stranded and injured pilgrims from the places which were cut off completely. The highest priority was Kedarnath valley.
- Air logistics operations were carried out to places which were inaccessible by road. Food, rations, medicines and State Electricity Board equipment was delivered. All positioning sorties for evacuation ensured maximum load.
- Optimal utilisation of the air effort was ensured. No leg was flown empty. If a certain number of personnel evacuated / cargo was carried from a higher elevation helipad, then additional personnel / cargo were picked up from helipads enroute at lower elevations.

**Tarmac Management:** A helicopter, being a most versatile platform, needs the least form of organised tarmac and airfield facilities. However, some degree of tarmac management is necessary for every operation. The make-shift tarmac arrangements put up at helipads merit special mention. There was a regular requirement to marshal small and big vehicles for loading relief material, taking out casualties, and refuelling, and smaller vehicles to collect role equipment/ lashing materials from each helicopter. All air warriors were sensitised to the need to escort each and every vehicle and personnel close to the helicopter. This was meticulously executed and their untiring and smart movements sustained for the entire duration.

At detachments where helicopters were operating with the ITBP or police, the respective agencies provided security and lodging. In general, after intense liaison, all administrative requirements were met by the state government. Food, lodging and transport were provided for all personnel adequately. At civil helipads, the security for the aircraft and helipad was provided by the state police. Security was beefed up by doubling of the Central Industrial Security Force (CISF)/ police guards when deemed necessary, with the ground crew visiting helipads throughout the night. The state agencies/

ITBP/army established an organised and systematic reception of passengers brought by helicopters at the helipads. Local volunteers established dawn to dusk kitchens to provide food to one and all operating and assisting at various helipads.

### **FUEL CONSTRAINTS**

The detachments at various locations were restricted in operations by the availability of fuel. Availability of fuel was a major restraining factor in the initial few days. This problem sometimes came up during the later part of the operations in Phase II also as the roads kept getting washed away due to the incessant rains and landslides.

- **Fuel Availability at Dharasu:** Dharasu was temporarily cut off by road from Rishikesh and the Indian Oil Corporation (IOC) fuel bowser was stuck enroute. Both the helicopters at Dharasu had just sufficient fuel to carry out only one hour sorties each. I was apprised of the same. The Mi-26 was tasked to position two fuel bowsers early in the morning on June 22. Post arrival of the bowsers, the C-130J was landed to defuel into Aviation Turbine Fuel (ATF) bowsers [Fig 10(a) and Fig 10(b)]. A total of about 15KL was defuelled from the C-130J in two shuttles which sufficed for the day's requirements. The IOC bowser and the tankers maintained continuous fuel supply from June 23.
- **Fuel Availability at Upper Guptkashi:** With the rebuilding of Kedarnath as one of the major focus areas of the civil government, the requirement of positioning material from Upper Guptkashi came to the fore. The non-availability of bowsers, due to the unserviceability of the deteriorated road conditions, hampered the positioning of fuel. This was communicated to the state officials through written correspondence as well as during various meetings.

### **STAGING FORWARD**

Between June 19-21, the strength of IAF helicopters rose to 45 – the single largest commitment ever in the history of the IAF for Humanitarian Response and Disaster Relief (HADR). As has been explained earlier, 6-8

bases were only the forward main nodes; during the operations, there were numerous sub-nodes such as Maitli, Munsiyari, Dharchula, etc. in all the sectors. An extremely dynamic situation was met by an equally flexible and responsive system. By July 1, 2013, 19,600 persons and casualties had been evacuated from this most difficult terrain encompassing two mountain states. More than 650 tonnes of relief supplies had been pumped in, including thousands of packets of survival rations (Table 2). Almost 1,500 NDRF, para medics, doctors, volunteers, etc had been moved forward to help out in the evacuation plan: the first phase of Operation Rahat had been successfully achieved in record time and effort.

Table 2

<b>OP RAHAT</b>						
<b>OPS SUM - HEPTRS : AS ON 19 AUG 13 (A WORLD RECORD)</b>						
TYPE	RELIEF OPS		LOAD		PAX	
	SOR	HRS	LDG	DROP	LAND	WING HING
MI17 IV	492	201:14	123.875	0.700	4860	0
MI-17 V5	1373	509:51	348.669	5.256	12565	31
ALH	1371	448:44	185.828	4.800	5598	115
CTA	78	28:20	0.752	0.150	114	18
MI-26	19	16:30	86.780	0.000	201	0
<b>TOTAL</b>	<b>3333</b>	<b>1204:39</b>	<b>745.904</b>	<b>10.906</b>	<b>23338</b>	<b>164</b>

Besides helicopters, the operation was backed by a fleet of fixed-wing aircraft. Almost eight aircraft were dedicated for operations in the sector in support of the helicopter effort. The latest in the IAF's inventory of communications and networking equipment was deployed at the earliest. The task force was in communication with the entire IAF, and this greatly facilitated the supply chain management to keep all 45 helicopters serviceable at all times. Innovation and adaptability were key words in setting up a rudimentary maintenance infrastructure to support this operation which lasted two months: Phase I for rescue and relief ; Phase II for rehabilitation support.

**Innovative Use of C-130J Hercules 'Weather Bird':** A demanding situation brings out the best in air warriors. The need of the hour was to undertake missions in a most professional manner, with adequate safety.

**Close liaison was kept with the civil authorities for the coordination of the relief task. A joint operation room was established at the airfield dispersal at Jolly Grant airport for smooth flow of operations.**

The overflying C-130J 'Weather Bird' would be contacted on R/T by the lead helicopter. The 'Weather Bird' would now act as the weather guide and also relay VHF communication to the following train of helicopters. Information, including specific speeds and heights to be maintained at various locations in the valley and general weather conditions at every turning point, would be passed to the following helicopters based on the real time situation faced by the leader. This not only facilitated the weather assessment but gave considerable confidence to the aircrew following the lead helicopter.

#### **COORDINATION WITH CIVIL ADMINISTRATION**

Close liaison was kept with the civil authorities for the coordination of the relief task. A joint operation room was established at the airfield dispersal at Jolly Grant airport for smooth flow of operations. Daily and hourly meetings were held with the civil authorities wherein critical areas were discussed and the thrust for the day decided. Representatives of the state government, ITBP, state police and NDRF were always present at the airfield, as also Non-Governmental Organisations (NGOs) and the media. Extensive use of the civil communication network was made for information like aircraft position and weather reporting where there was no R/T contact. I had regular meetings at the Secretariat with the core group headed by the Chief Secretary and Mr VK Duggal of the National Disaster Management Agency (NDMA). On June 19, the home secretary, and on June 22 and 27, the home minister, were briefed in detail on the progress of the operations and critical requirements. Handling all hierarchies of the HADR set-up is critical in understanding the evolution of a highly successful endeavour. More about this in later paragraphs.

## ADMINISTRATION

At detachments where the helicopters were operating with the ITBP or police, the respective agencies provided security and lodging. In general, after intense liaison, all administrative requirements were met by the state government. Food, lodging and transport were provided for all personnel adequately. At civil helipads, the security for the aircraft and helipad was provided by the state police. Security was beefed up by doubling of the CISF/police guards when deemed necessary, with the ground crew visiting the helipads throughout the night.

The state agencies/ ITBP/army had established an organised and systematic reception of passengers brought by helicopters at the helipads, with proper registration and a computerised missing person's bureau. This was critical in getting dispersed and separated families together and contacting family members across the country. Local volunteers established dawn to dusk kitchens to provide food to one and all operating and assisting at various helipads.

## MOBILE COMMUNICATION

During the initial days of the operations when things were still settling down and the number of aircraft was continuously increasing, passing of information was an issue. The younger aircrew came up with an ingenious plan of usage of smart phones for this purpose. A user group on Operation Rahat was formed on 'Whatsapp': this acted as a notice board for the aircrew where important information was available to everyone with a single post on Whatsapp. The efficacy of such a system was clearly evident during the operations; however, it was limited to the areas with mobile network availability and mainly in the unsecured realm. Wherever available, the use of the mobile network was made to the fullest for easy flow of information.

**The younger aircrew came up with an ingenious plan of usage of smart phones for this purpose. A user group on Operation Rahat was formed on 'Whatsapp': this acted as a notice board for the aircrew where important information was available to everyone with a single post on Whatsapp. The efficacy of such a system was clearly evident during the operations.**

SOPs were put in place for the requisitioning agencies to provide 'prepaid local SIM cards' to key persons. The detachments were provided with low cost handsets so that these SIM cards could be used exclusively for service purposes. On completion of the task, these SIM cards and mobile phones were returned to the respective agencies.

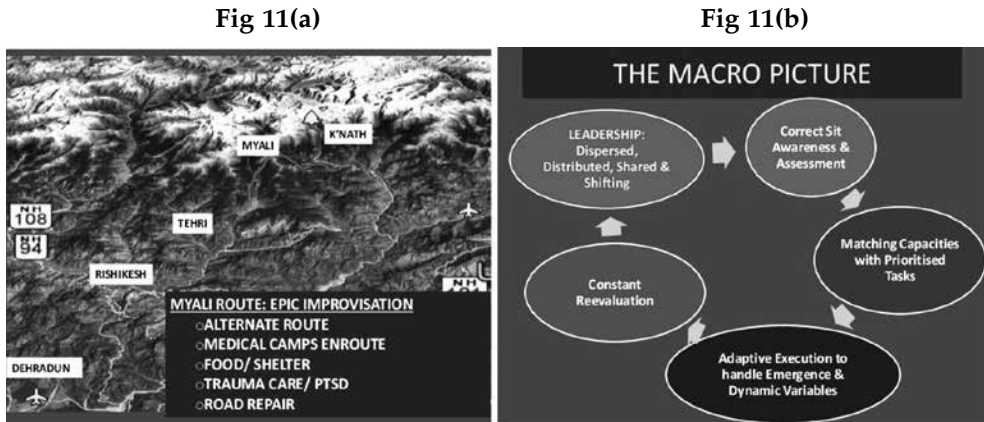
### **MANAGEMENT OF CIVILIAN INPUTS/ INTERFACE**

It is important to understand the civilian-military interface, and even interference, during this operation. It truly exemplified how extreme complexities bring about frictions at all levels which need to be managed effectively. The evolution of a successful campaign which involves multiple agencies is an end result of negotiations, bickering, hot debates on perceived priorities, and gross political and bureaucratic interference. In the military, the idea of responsibility and accountability are well-ingrained and laid out. As the TFC, I was clear that how air operations evolved was my baby, and command and control of IAF assets, and in general, the air effort was my responsibility. However, such clear-cut divisions were not equally perceived by all. In the paragraphs that follow, the evolution of all the operations is chronicled to bring out this aspect.

**June 19:** Immediately after arrival, I called for a meeting of all the agencies. Till that time, the DM of Dehradun was the chief coordinator from the civil side. He was clueless about the extent of damage because he had taken over on June 18 after the then DM suffered a heart attack. On the issue of prioritisation, he requested me to do whatever the IAF assessed best. I had a meeting with the available Commanding Officers (COs) and pilots for a holistic assessment. It was clear that in the light of the three major factors i.e. time-criticality, terrain and weather, it was imperative that assets be forward based in order to save thousands of lives. However, the civil set-up, seeing the logistics of the plan, was not keen at all and kept putting up a number of hurdles. Also linked to this concept was the opening up of a number of alternate roads to facilitate evacuation since all the major arterial roads were cut off. This too was vehemently opposed because of the elaborate effort required on the ground. For example, the alternate route from Guptkashi via



Mayali and Tehri allowed only light vehicles and some urgent patch repair by the Public Works Department (PWD) [Fig 11(a) and Fig 11(b)].



In the afternoon, after an aerial recce with the home secretary, a meeting was chaired by Shri RK Singh with the chief secretary, all the secretaries, DGs of the ITBP, NDRF and state police. In a one-on-one session earlier, I had explained my broad plan which he was convinced about. He passed the necessary orders (backed by written minutes by Fax from the Home /Ministry). Both issues of forward basing and alternate roads for further evacuation in all valleys were addressed. Another important issue discussed in the one-on-one session with me was a comparison of the airlift between civilian and IAF helicopters. It was alleged that the civilians were lifting far more than the IAF. By that time, I had got inputs from various sources, including civil pilots (my retired coursemates). I put forward the following issues:

- While civilian helicopters were present in and around Guptkashi from the date of deluge (June 16), no rescues were undertaken from the Gaurikund-Rambara stretch where people were dying in scores. The first foray into the area was on June 18 when an IAF ALH first ventured there. A second IAF ALH joined it in the evening yet no civil helicopter came. This despite the state government knowing that there were no gravely

**The civilian helicopter evacuations were exaggerated since no manifests or requisitions were being documented. Each passenger was linked to state reimbursement, therefore, there was an incentive to make money, with no checks and balances in place.**

injured people in Kedarnath—it was only cut off—while the near-dead and injured in the lower valley required immediate attention.

- Hundreds were evacuated on June 17 and 18 by civilian helicopters; however, with an elaborate arrangement with the state police, only people by name were evacuated. The TV sting that showed money changing hands was just the tip of the iceberg. An extremely dirty money-game was on.

- The civilian helicopter evacuations were exaggerated since no manifests or requisitions were being documented. Each passenger was

linked to state reimbursement, therefore, there was an incentive to make money, with no checks and balances in place.

As a result of the above inputs, the home secretary immediately passed instructions to the chief secretary and secretary aviation for remedial measures. From the next day itself, there was a drastic drop in the civil numbers—from thousands to a few hundred daily. The other important issue discussed on June 19 was about positioning of fuel at the forward bases of Rampur, Dharasu, Guptkashi, Gauchar, Joshimath, Bageshwar, Dharchula and Munsiyari. IOC gave its commitment to the strategy, however, in the light of the positioning time and road conditions, asked for a few more days. In the light of the time-critical nature of the operations, the plan to launch the Mi-26 with bowsers and fuel barrels was hatched and implemented. The union home secretary used to call on a daily basis to check on the progress of the above issues. Had the IAF not insisted on the plan and avoided compromises, the number of days for the successful rescue operations would have doubled.

**June 20:** While the detachment plan was being executed, there were numerous glitches, clarifications from the DMs, and refusal to comply at the tehsildar level. Virtually, the whole day was spent along with state government officials to iron out all the administrative aspects. The IAF was

given urgent feedback on the requirements to beef up the infrastructure, including communications, logistics, maintenance, security and vehicles. The command responded with alacrity and things started moving immediately. An input from Sqn Ldr Naidu (ALH pilot) on survivors cut off at Jungle Chatti, galvanised everyone into action. A plan was made and the next day, 16 NDRF personnel were winched down to clear a helipad and aid the survivors. The fuel plan involving a variety of aircraft and helicopters also required constant liaison with the civil authorities on a variety of issues.

Another important issue was management of people on the helicopter tarmacs at various places. An SOP was made and modified to local conditions, which the civil side was persuaded to follow. The command and control of all activities shifted to the task force/ detachments. This was a vital aspect for flight safety since movement of thousands of pilgrims, and hundreds of other agency personnel and volunteers was involved on a daily basis.

**June 21:** While the rescue phase was actively on, the core group got together to discuss about rebuilding of the infrastructure. The IAF's assessments of road damage, done jointly with the Border Roads Organisation (BRO) proved to be realistic and effective. Also, a plan involving moving of heavy equipment such as dozers and compressors by the Mi-26 was suggested to the authorities. This plan and its execution proved critical even when the rescue/ relief phase was on. Importantly, it also optimised the flying effort of the IAF.

**June 22:** This was an extremely important day. The home minister convened a meeting with the chief ministers of Uttarakhand and Himachal Pradesh, all state government secretaries, and a number of secretaries from the Centre holding critical portfolios. This was a meeting wherein critical decisions/ revisions were to be made. As brought out earlier, the home secretary (union) was personally briefed by me on the grand plan and he had been in touch with me since June 19. However, in the meeting, he brought out a changed deployment which was just not feasible, since it was politically influenced. I stood firm on my plan which was fully adaptive, and carried out a presentation detailing the logic behind it. Everyone was finally convinced of the professional plan. In fact, it was this very plan which ensured that

the Kedar valley was cleared by June 23, Gangotri (Harsil) by June 30 and Badrinath by July 2.

The success of the operations removed all misgivings and I got repeated (almost daily) calls from the home secretary on the progress till he retired on June 30. Shri Shinde, the union home minister, personally congratulated me on June 26, when he came down for the funeral of the martyrs. He complimented me on the extremely complex but good and do-able plan that the IAF was executing.

**June 25:** I was suddenly requested by the chief minister's office at 0900 hrs to brief the Members of Parliament (MPs) on my assessments. I conducted a half-hour session wherein they were shocked by the numbers of dead that I gave them (5,000-7,000). Their briefing in Delhi had a maximum figure of 500. They seemed to be completely convinced about my logic on the issue as well as on the priorities of the overall effort. After this, I had the complete trust and faith of all the state government ministers and officials; at least, in terms of non-interference with operational plans.

**The Medical Plan:** This was as complex as the helicopter operations. Some vignettes follow [Fig 10(a) and Fig 10(b)]. Air-dropped specialist troops made the clearings for the helicopters to land, and find and help survivors to reach the pickup point. After first-stage evacuation, immediate medical aid was administered in various degrees, including resuscitation and emergency medical procedures. Severe cases were marked for further air evacuation while the rest, after registration, were moved by convoys. While all the valleys had problems of overcrowding, lack of infrastructure, shortage of medicines and doctors, an unhygienic environment all around, it was Kedarnath valley that was the worst affected, with thousands dead. Based on pilot reports and survivor accounts, a mosaic of priority areas was prepared, and relief, medicines, doctors, policemen and civil servants were heli-dropped at various sites.

- **Forward Throw:** Since many of the places had no medical set-ups or only rudimentary ones, detachments of paramedics were identified and despatched to the forward locations. However, the number of patients requiring immediate or continuous care overwhelmed the

initial deployments. Volunteers from major hospitals did not want to be deployed at field bases where conditions were raw and difficult. Such teams consisting of surgeons and super-specialists were positioned at large relief camps such as at Rishikesh.

- **Recruitment of Interns:** Seeing the large volume and the critical need of triage, I suggested to the chief minister and chief secretary that young doctors who could bring greater energy and passion to the difficult task at the forward locations be hired. About 27 interns were hired with the promise of permanent jobs depending on their performance during the crisis management.
- **Adaptive Response:** The situation at Guptkashi, where the maximum number of patients was received and triage carried out, was extremely dynamic and fast changing. From unmanageable psychiatric patients (one had lost all 16 family members) to handling thousands in a day (post discovery of Jungle Chatti), a very flexible and adaptive system was adopted. At times, additional doctors / paramedics were shifted from one valley to another as a temporary surge. Since most patients were old pilgrims who had lost all their possessions, monitoring their health and medication was a humungous effort.
- **Centralised Resource Distribution:** Based on active 24X7 inputs from many such points, medical supplies, including drinking water, were despatched from Dehradun. The Chief Medical Officer (CMO) of the state and his team were continuously on this job. The Indian Army looked after the food and organising at Harsil and Badrinath, involving tens of thousands of people. A major army medical set-up was put in place at Joshimath to cater for medical traffic from Badrinath.

Fig 12(a)



Fig 12(b)



**NDMA Interactions:** Shri VK Duggal, ex-union home secretary, was deputed as the chief coordinator for relief and rehabilitation. After the first few meetings, he became aware that he was dealing with an independent, fair and professional leadership of the IAF. True to his style, pressures were created and calls made to the Ministry of Defence and Air Headquarters (HQ), however, seeing the no-nonsense approach of both, he fell in line. After some time, a very healthy working relationship developed where he trusted my judgment even on aspects removed from the air operations. For example, the way ahead in reclaiming Kedarnath, BRO tasks, quantification of the never-ending appetite for relief supplies of some districts, etc. The politicis of Kumaon versus Garhwal region relief package became a major bone of contention. The political games played by parties comprise a reality that exists around the world. The necessary corrective action was taken by the chief minister, including posting out of some senior officers.

**Media Handling:** For the first 3-4 days, I did not allow the media to come in, since the focus was required on assessments, drafting safe SOPs and prioritisation. We started to give short updates when permission was granted by the CAS. Later, the media were taken on board without compromising on the mission. The basic premise in handling the media was to give out correct facts only and keep away from politically-loaded questions. Finally, what matters is the substance; and our efforts got appreciated as time passed. The presence of two

defence public relations officers (IAF officers) helped greatly as the preliminary sifting, prioritising and fairness to all was ensured without detracting from the main effort.

## CONCLUSION

Operation Rahat was one of the biggest, and definitely the most complex, HADR mission so far for the IAF. Coordination amongst various agencies, effective utilisation of all available resources and common sense solutions were some of the factors in its success. Some make-shift arrangements helped in improving effectiveness during the course of these operations. A high level of coordination was achieved between the aircrew and ground crew, ensuring successful completion of missions. Both man and machine operated to their limits within the safety margins to execute all missions in record time. Regular interaction with the civil administration and all other agencies ensured better planning and optimal execution.

The rescue and relief action in Operation Rahat saw a convergence of organisations from the government, NGOs and different communities. In the dynamism and complexity that the problem presented lay the foundation of trust and coordination that allowed very effective collaboration, albeit with some obstacles and issues along the way. Swift trust came through established credibility and reputations of organisations. But a big contributor was the demonstrated performance of actors and individuals as time went by. This allowed delineation of roles and responsibilities without a strict hierarchy. The shared goals and the vision of an end-state allowed an environment that facilitated a collaborative approach.

# INDEX

## VOL. 1, NO. 1. MONSOON 2004 (JULY-SEPTEMBER)

1. A Great Leap Forward: Air Operations at Sea  
*Arun Prakash* 1-11
2. The Trinity of Air Power: Doctrine, Strategy and Technology  
*Ajit Bhavnani* 13-41
3. The Essence of Aerospace Power: What Leaders Need to Know  
*M. Drew* 43-55
4. Air War in Kosovo  
*Vinod Patney* 57-77
5. Air-land Warfare: The Imperatives of Jointness  
*V.G. Patankar* 79-87
6. Air Power in Afghanistan War  
*Kapil Kak* 89-108
7. Pakistan's Nuclear Threshold and India's Options  
*Gurmeet Kanwal* 109-124
8. China's Space Programme: An Overview  
*K. K. Nair* 125-156
9. Some Reflections on The IAF  
*Jasjit Singh* 157-179

## VOL. 1, NO. 2. WINTER 2004 (OCTOBER-DECEMBER)

1. Force Modernisation Planning Challenges  
*Jasjit Singh* 1-28
2. Nine Decades of Air Warfare  
*B.K. Bishnoi* 29-48
3. Strategising Aviation Industry  
*S.R. Deshpande* 49-72
4. Future Wars and Aerospace Power  
*Vinod Patney* 73-98
5. Naval Policy and Strategy of Pakistan  
*V. Sakhuja* 99-123
6. China's Aircraft Carrier Ambitions: Seeking Truth from Rumours  
*Ian Storey and You Ji* 125-146
7. Weaponisation of Space  
*Manpreet Sethi* 147-167
8. Indo-Russian Cooperation in Military Aviation: An Overview  
*Bharat Kumar* 169-193

## VOL. 2, NO. 1. SPRING 2005 (JANUARY-MARCH)

1. Network-centric Warfare: SME Fundamentals  
*Prem Chand* 1-24
2. Space Theory and Doctrines  
*K.K. Nair* 25-52
3. Air Power in Land Operations  
*Gurmeet Kanwal* 53-71
4. Satellite Imagery for Air Operations  
*D.N. Ganesh* 73-90



## INDEX

---

5. Russian Aviation Industry Trends  
*Deba R. Mohanty* 91-112
6. Strategic Leadership: Defining the Challenge  
*Michael Guillot* 113-128
7. Pakistan's Space Capabilities  
*Ajey Lele* 129-148
8. Arms Trade Offsets: The Key to Energise Our Defence Industry  
*Jasjit Singh* 149-177

### **VOL. 2, NO. 2. SUMMER 2005 (APRIL-JUNE)**

1. Precision Strike and Its Influence on Future Wars  
*V. Patney* 9-24
2. RMA and Aerospace Technologies (Part I)  
*M. Matheswaran* 25-46
3. Kashmir, Covert War and Air Power  
*Jasjit Singh* 47-67
4. Air Power and Special Operations  
*Saikat Datta* 69-95
5. Mackinder in the Aerospace Age  
*Anil Trikha* 97-117
6. Strategic Planning for the Air Force  
*Deborah L. Westphal, Richard Szafranski and Gregory S. Parnell* 119-139
7. Shrinking, Flourishing or Both? Global Defence Industry in Transition  
*Deba R Mohanty* 141-160
8. Time: The Critical Dimension in War  
*Ajay Singh* 161-179

### **VOL. 2, NO. 3. MONSOON 2005 (JULY-SEPTEMBER)**

1. Indo-US Relations in a Changing World  
*K. Subrahmanyam* 1-21
2. IAF and UN Peace-keeping Operations  
*Kapil Kak* 23-36
3. The Congo Diary  
*Charanjit Singh* 37-47
4. RMA and Aerospace Technologies (Part II)  
*M. Matheswaran* 49-71
5. Network-Centric Warfare  
*Rohit Varma* 73-90
6. Merging Frontiers of Air and Space  
*K.K. Nair* 91-115
7. Planning to Win  
*J.P. Humerwadel* 117-157
8. Nuclear Strategies in the Age of Missile Defences  
*Manpreet Sethi* 159-184

### **Vol. 2, No. 4. Winter 2005 (October-December)**

1. Indian Air Force in the Evolving Security Environment  
*S.P. Tyagi* 1-15
2. Joint Operations in Modern Warfare: Place, Role, and Impact of Air Power  
*Sartaj Bedi* 17-33
3. Static Principles of War in a Changing World  
*Sanjay J. Singh* 35-55

## INDEX

---

4. Planning Military Power for the Future <i>Jasjit Singh</i>	57-72
5. Centres of Gravity: Relationship with Effects-based Operations and Campaign Planning <i>A.S. Bahal</i>	73-90
6. Air Power and Asymmetric Challenges to India <i>T.D. Joseph</i>	91-112
7. ISR for Air Operations <i>T.M. Asthana</i>	113-128
8. ISR Doctrine, Technologies and Organisation for Air Operations <i>Bharat Kumar</i>	129-154
9. China's Nuclear Command and Control <i>Stephen Polk</i>	155-174

### **Vol. 3, No. 1. Spring 2006 (January-March)**

1. Joint Operations in Modern Warfare <i>M. Sabharwal</i>	1-30
2. Brahmastra of Future Wars "The Brahmos" <i>R.S. Nagra</i>	31-42
3. International Defence and Military Cooperation <i>A. Muthanna</i>	43-61
4. Trends in Defence Expenditure: India, China and Pakistan <i>V. N. Srinivas</i>	63-82
5. Military Modernisation in China: Some Implications for India <i>T.D. Joseph</i>	83-109
6. Pakistan's Conventional Arms Acquisitions: Priorities and Prospects <i>Shalini Chawla</i>	111-133
7. Indian Civil Aviation: A Revolution in the Making <i>R. Chidambaram</i>	135-150
8. In Search of High Ground: Air Power Trinity and the Decisive Potential of Air Power <i>David K. Edmonds</i>	151-177

### **VOL. 3, NO. 2. SUMMER 2006 (APRIL-JUNE)**

1. Management of Our Defence: Role of the COSC <i>Jasjit Singh</i>	1-28
2. Budgetary Reform for Sustained Modernisation <i>Amiya Kumar Ghosh</i>	29-58
3. Indian Defence Industry: Insulation Gradually Melting <i>A. Vinod Kumar</i>	59-84
4. Satellite Reconnaissance, ISR and Counter-measures <i>A.S. Bahal</i>	85-101
5. UAVS: Capabilities and Trends: A Case Study of the USA, Europe and Israel <i>Rajiv Goyal</i>	103-131
6. Beyond Utility Targeting: Toward Axiological Air Operations <i>W.W. Wijnnga and Richard Szafranski</i>	133-155
7. Ethics and Values in Military Leadership <i>Arjun Subramaniam</i>	57-176

### **VOL.3 , NO. 3. MONSOON 2006 (JULY-SEPTEMBER)**

1. Indo-US Strategic Relations: The Nuclear Dimension <i>Manpreet Sethi</i>	1-26
2. India-China Relations: An Overview <i>Kapil Kak AVSM VSM (Retd)</i>	27-47
3. China's War Concept <i>Gurmeet Kanwal (Retd)</i>	49-74

## INDEX

---

4. RMA with Chinese Characteristics  
*Vinod Anand (Retd)* 75-94
5. Doctrine, Strategy and Nuclear Weapons  
*Rajesh Rajagopalan* 95-108
6. Military Aerospace Supply Chain  
*Samir Chabra* 109-121
7. Indian Defence Procurement Policy  
*V.N. Srinivas* 123-138
8. The Epistemology of War Gaming  
*Robert C. Rubel* 153-178

### **VOL. 1, NO. 2. WINTER 2006 (OCTOBER-DECEMBER)**

1. A Vision of India's Maritime Power in the 21<sup>st</sup> Century  
*Arun Prakash* 1-12
2. Strategic Role of Air Power: How we Need to Think, Train and Fight in the Coming Years  
*Arjun Subramaniam* 13-32
3. Interpreting the Lebanon War of 2006  
*Jasjit Singh* 33-61
4. Leveraging Space Capabilities for India's Defence  
*D.C. Kumaria* 63-87
5. Defence Manpower in India: Some Salient Issues  
*Gurmeet Kanwal* 89-107
6. Nuclear Security: Critical for Future Nuclear Expansion  
*Manpreet Sethi* 109-134
7. Logistics Management Practices  
*Rahul K. Bhonsle* 135-153
8. Has IT worked? The Goldwater Nichols Reorganisation Act  
*James R. Locher III* 155-182

### **VOL. 2, NO. 1. SPRING 2007 (JANUARY-MARCH)**

1. Future of Aerospace in India: Status and Strategy  
*M.M. Pallam Raju* 1-14
2. Aerospace Power and Integrated Operations  
*N.A.K. Browne* 15-36
3. Strategic Roles of Air Power: Think, Plan, Equip and Train for IT  
*A.S. Bahal* 37-56
4. Interpreting China's National Defence Policy  
*Gurmeet Kanwal* 57-85
5. Offensive Air Power in the High Mountains  
*R. G. Burli* 87- 105
6. AWACS: The Pivot of Aerospace Power  
*Atul Kumar Singh* 107-137
7. Pakistan's Defence Spending: Some Trends  
*Shalini Chawla* 139-157
8. The Essence of Coercive Power: A Primer for Military Strategists  
*Karl Mueller* 159- 174

### **VOL. 2, NO. 2. SUMMER 2007 (APRIL-JUNE)**

1. The Challenges Ahead for India's Foreign Policy  
*Shivshankar Menon* 1-10
2. Strategic Reach - Strategic Depth and the Question of the IAF's Strategic Posture  
*Jasjit Singh* 11-26

## INDEX

---

3. India's Nuclear Doctrine: The Basis for Credible Deterrence <i>Manpreet Sethi</i>	27-56
4. China's ASAT Test: Implications and Options <i>K. K. Nair</i>	57-74
5. Force Multipliers and Transformation of Air Defence <i>Atul Kumar Singh</i>	75-106
6. Military Power and Strategy of Iran <i>Shelly Johnny</i>	107-132
7. US Defence Industry Trends <i>Ashok Sharma</i>	133-156
8. The Impact of New Technologies in the Military Arena: Information Warfare <i>Paulo Fernando Viegas Nunes</i>	157- 178

### **VOL.2 , NO. 3. MONSOON 2007 (JULY-SEPTEMBER)**

1. Aerospace Power in a Changing National Security Environment <i>F.H. Major</i>	1-12
2. Winning the Next War-Jointly <i>Jasjit Singh</i>	13-28
3. Principles of War: Do They Require a Rethink? <i>A.V. Vaidya</i>	29-44
4. Effect-Based Operations <i>Vinod Patney</i>	45-58
5. From Winning to Deterring: China's Changing Discourse on Defence <i>Srikanth Kondapalli</i>	59-74
6. Pakistan's Nuclear Doctrine and Strategy <i>Manpreet Sethi</i>	75-109
7. Iranian Political System and the IRGC <i>Shelly Johnny</i>	111-137
8. Russia's Air Defence Strategy <i>Atul K. Singh</i>	139-162
9. The Information-based RMA and the Principles of War <i>Leonard G. Litton</i>	163-180

### **VOL. 2, NO. 4. WINTER 2007 (OCTOBER-DECEMBER)**

1. Financing Force Modernisation <i>Vinod K. Misra</i>	1-11
2. Airspace Management: A Synergised Approach <i>Atul K. Singh</i>	13-35
3. Roles and Missions of the Indian Air Force-2032 AD <i>Vinod Patney</i>	37-55
4. Change and Continuity in Warfare: An Indian Experience <i>P.K. Mallick</i>	57-77
5. Disinformation and National Defence <i>V.K. Verma</i>	79-94
6. Network-Centric Warfare and its Strategic Implications <i>M. Matheswaran</i>	95-119
7. Leveraging Outer Space for National Security <i>Ranjana Kaul</i>	121- 145
8. Pakistan's Nuclear Posture: Implications of Indo-US Cooperation <i>Peter R. Lavoy</i>	147-174

## INDEX

---

### **VOL. 3, NO. 1. SPRING 2008 (JANUARY-MARCH)**

1. National Governance and Internal Security  
*N.N. Vohra* 1-16
2. Joint Capability Requirements of India's Armed Forces: 2008-2033  
*Kapil Kak* 17-32
3. Military Manpower: Managing Quality and Costs  
*Verghese Koithara* 33-60
4. Defence Finance  
*A.V. Vaidya* 61-76
5. Towards Continuous Military Education in the IAF: a Need for Yesterday  
*M. Misra* 77-105
6. Space Security: Some Issues of Militarisation and Weaponisation  
*Kaza Lalitendra* 107-135
7. Interface Between Conventional and Nuclear Deterrence: A Case for the Indian Subcontinent  
*G.D. Bakshi* 137-157
8. False Gospel for Air Power Strategy? A Fresh Look at Giulio Douhet's "Command of the Air"  
*Michael D. Pixley* 159-178

### **VOL. 3, NO. 2. SUMMER 2008 (APRIL-JUNE)**

1. Indian Air Force in the Decades Ahead  
*F.H. Major* 1-8
2. Force Structuring and Doctrines of the IAF  
*Bhashyam Kasturi* 9-25
3. Strategic Role of Air Power  
*Sanjeev Bedi* 27-45
4. Electronic Warfare in the 21<sup>st</sup> Century  
*Sanjay Poduval* 47-73
5. Modernisation of the Pakistan Air Force  
*Shalini Chawla* 75-96
6. Inside the Labyrinth: NATO's Mission in Afghanistan and Continuing Relevance of Pakistan  
*Shelly Johnny* 97-122
7. Survivability of the Arsenal: The Essence of Successful Nuclear Deterrence  
*Manpreet Sethi* 123-146
8. Planning for Legitimacy: A Joint Operational Approach to Public Affairs  
*Tadd Sholtis* 147-168

### **VOL. 3, NO. 3. MONSOON 2008 (JULY-SEPTEMBER)**

1. Aerial Warfare: the Indian Way  
*V.K. Verma* 1-13
2. Use of Air Power in Sri Lanka: Operation Pawan and Beyond  
*Arjun Subramaniam* 15-35
3. Army Aviation in India  
*Rajeev Ghose* 37-63
4. Dragon in Space: Implications for India  
*Kaza Lalitendra* 65-98
5. Nuclear Deterrence and Conventional War: A Test of India's Nuclear Strategy  
*Manpreet Sethi* 99-118
6. Defence Procurement Challenges and New Paradigm Shift  
*J.V. Singh* 119-144
7. Leveraging Offsets in Arms Trade: Options for India  
*V. N. Srinivas* 145-170

## INDEX

---

### **VOL. 3, NO. 4. WINTER 2008 (OCTOBER-DECEMBER)**

1. The Rocky Road to Full Jointness  
*Benjamin S. Lambeth* 1-34
2. Indian Air Force: Building Indigenous Research Capability  
*T.M. Asthana* 35-50
3. Why and How of Air Dominance  
*A.V. Vaidya* 51-66
4. Pakistan's Navy: New Capabilities, New Roles?  
*Shalini Chawla* 67-93
5. Weaponisation of Outer Space and National Security: Faultlines in the Law  
*G.S. Sachdeva* 95-115
6. Ballistic Missile Defence: Strategic Issues and Dilemmas  
*Anand Sharma* 117-149
7. Defence Transformation: An Appraisal  
*P.K. Mallick* 151-179

### **VOL. 4, NO. 1. SPRING 2009 (JANUARY-MARCH)**

1. National Defence and Aerospace Power  
*Fali H. Major* 1-5
2. Building Air Dominance  
*T. M. Asthana* 7-21
3. Future Shape, Size and Role and Shape of Indian Air Force  
*P.K. Mehra* 23-42
4. Analysis and Assessment of Military Operational Requirement of AWACS in IAF  
*A.B.S. Choudhry* 43-62
5. China's Space Power  
*Srikanth Kondapalli* 63-78
6. Missile Defence: Concepts and Technologies  
*Anand Sharma* 79-111
7. The Evolution of the Cruise Missile Discourse: A Conceptual Construct  
*Sitakanta Mishra* 113-140
8. Transformation in Military Logistics  
*J.V. Singh* 141-174

### **VOL. 4, NO. 2. SUMMER 2009 (APRIL-JUNE)**

1. Employment of Aerospace Power: Regional Imperatives for Change  
*Fali Homi Major* 1-8
2. India's Tibet Problem  
*Prem Shankar Jha* 9-22
3. China's Air Force in the Coming Decades: Trends and Implications  
*Rajiv Ghose* 23-50
4. Force Modernisation: Principles and Practice  
*S. Sammadar* 51-71
5. History and Evolution of Network-Centric Warfare  
*Sanjay Poduval* 73-97
6. Focussed and Dynamic Response Logistics  
*J.V. Singh* 99-132
7. Air Dominance: Concept and Practice  
*Vinod Patney* 133-148
8. Air Dominance in 4<sup>th</sup> Generation and Irregular Warfare  
*Arjun Subramaniam* 149-165

## INDEX

---

### **VOL.4, NO. 3. MONSOON 2009 (JULY-SEPTEMBER)**

1. North Korea's Nuclear Tests  
*Jayadeva Ranade* 1-16
2. Six Decades of Peacekeeping  
*E.R. Rajappan* 17-51
3. Lowering the High Ground for Effect-based Operations  
*Kaza Lalitendra* 53-90
4. AWACS and Aerostats: Roles and Missions  
*A.B.S. Chaudhry* 91-115
5. The Revolution of Cruise Missile Technology  
*Sitakanta Mishra* 117-143
6. Review of the Defence Budget  
*Amiya Kumar Ghosh* 145-192

### **VOL. 4 NO.4. WINTER 2009 (OCTOBER-DECEMBER)**

1. Implications of China's Navy Modernisation  
*Jaydeva Ranadev* 1-16
2. The Chinese Concept of Comprehensive National Power: An Overview  
*P.K. Ghosh* 17-54
3. Integrated Perspective Planning  
*A.V. Vaidya* 55-71
4. Counter-Terrorism  
*Rajiv Ghosh* 73-100
5. CTBT Exhumed: Need India Worry?  
*Manpreet Sethi* 101-124
6. Military–Media Relations: Can the Media be a Force Multiplier?  
*P.K. Mallick* 125-155
7. The Most Dangerous Nation  
*Amarjit Singh* 157-176

### **VOL. 5, NO.1. SPRING 2010 (JANUARY-MARCH)**

1. Air Power in Sub-Conventional Wars in the South Asian Region  
*Rajiv Ghose* 1-30
2. Towards 'Intelligent' Cruise Missiles: Contours of Innovation  
*Sitakanta Mishra* 31-54
3. Cyber Space Vulnerabilities and Challenges: Threats to National Security Dynamics  
*M.K. Sharma* 55-90
4. NCW: the Double-edged Sword  
*Sanjay Poduval* 91-115
5. Combat Support Operations in the Indian Air Force: A Historical Appraisal  
*A.B.S Chaudhry* 117-135
6. Climate Change and National Security: Contrarian or Interrelated?  
*Manoj Kumar* 137-152
7. India-Afghanistan Relations During the Soviet Intervention in Afghanistan  
*K.N. Tennyson* 153-183

### **VOL. 5, NO.2. SUMMER 2010 (APRIL-JUNE)**

1. On Air Power  
*K.K. Jumbo Majumdar* 1-3
2. Air Dominance and the Future of Air Power  
*Jasjit Singh* 5-24
3. Integration of MoD and Defence Planning  
*R. Venkataraman* 25-51

## INDEX

---

4. Asia in the Debate on American Grand Strategy <i>Michael J. Green</i>	53-72
5. Defence Cooperation: A Case Study of India and Singapore <i>Pankaj Jha and Rahul Mishra</i>	73-96
6. Afghanistan and the American Strategic Perspective <i>Sanjeev Bhadauria</i>	97-115
7. Challenge for the Indian Military: Managing Ozone Depleting Substances <i>Manoj Kumar</i>	117-150
8. Geo-politics of the Gulf 1971-1991 <i>M.R. Khan</i>	151-177

### **VOL. 5, NO. 3. MONSOON 2010 (JULY-SEPTEMBER)**

1. Force Modernisation Challenges <i>P.K. Mehra</i>	1-16
2. Indigenisation of Air-Launched Weapons <i>S. Bhanoji Rao</i>	17-35
3. PLAAF in Transition 1979-93 <i>Vishal Nigam</i>	37-75
4. China's Electronic and Cyber Warfare Capabilities <i>Sanjay Poduval</i>	77-111
5. Towards a Nuclear Weapon Free World: Indian Perspectives <i>Swaran Singh</i>	113-128
6. National Security Mechanism and the HDO <i>R. Venkataraman</i>	129-153
7. Technology: A Historical Perspective <i>A.K. Singh</i>	155-183

### **VOL. 5, NO. 4. WINTER 2010 (OCTOBER-DECEMBER)**

1. China's Defence Industry: Organisational Reforms <i>Vishal Nigam</i>	1-30
2. Defining Strategic Culture <i>Arjan Sen</i>	31-54
3. Likely Demands on Future Leaders <i>Rajiv Ghose</i>	55-78
4. Deception in Strategic Thinking: a Diagnosis <i>S. Rajasimman</i>	79-105
5. India's Civil Nuclear Network: A Reality Check <i>Sitakanta Mishra</i>	107-132
6. Pakistan's Nuclear Delivery Systems <i>Shalini Chawla</i>	133-158
7. China's Military Strategy: Perspectives from the White Papers on National Defence <i>Shikha Aggarwal</i>	159-179

### **VOL. 6, NO. 1 SPRING 2011 (JANUARY-MARCH)**

1. The Iranian Nuclear Issue: India's Response <i>Asif Shuja</i>	1- 26
2. Interpreting China's Grand Strategy <i>J.V. Singh</i>	27-57
3. Chinese Space Programme: Influence of Chinese Strategic Culture on its Development <i>Manu Midha</i>	59-103
4. Defeating Pakistan's Nuclear Strategy <i>Manpreet Sethi</i>	105-122



## INDEX

---

5. China's Aircraft Carrier Ambitions  
*Nan Li and Christopher Weuve* 123-146
6. Security Structures in the Gulf: Past and Present  
*M.R. Khan* 147-173

### VOL. 6, NO. 2 SUMMER 2011 (APRIL-JUNE)

1. Impact of Offset Policy on India's Defence Industrial Capability and Policy Issues  
*S. N. Misra* 1-25
2. ATOMS FOR PEACE: Balancing the Promotion of Nuclear Energy and Non-proliferation  
*Hina Pandey* 25-46
3. Chinese Defence Forces: Modernisation After 1980  
*J. V. Singh* 47-78
4. Contours of India's Nuclear Safety  
*Sitakanta Mishra* 79-114
5. Domestic Politics Surrounding the Iranian Nuclear Programme  
*Asif Shuja* 115-142
6. Nuclear Weapons Proliferation in Asia: The Twenty-First Century Pattern  
*Yeon Jung Ji* 143-168
7. Understanding China's Military Strategy: A Study of the PLAAF  
*Shikha Aggarwal* 169-193

### VOL. 6, NO. 3 MONSOON 2011 (JULY-SEPTEMBER)

1. Some Aspects of Our Wars in Future  
*Jasjit Singh* 1-24
2. Air Power in Stability and Anti-Terrorist Operations  
*Arjun Subramaniam* 25-52
3. Air Power as an Instrument of Coercive Diplomacy  
*M. Bahadur* 53-68
4. The Barriers to Military Transformation  
*Rajiv Puri* 69-92
5. China's Civil Aviation Industry  
*Vishal Nigam* 93-112
6. Information Warfare: Elements and Forms  
*Rakesh Arora* 113-144
7. The Changing Patterns of Global Climate Change Architecture  
*Dhanasree Jayaram* 145-162
8. West Asia: Ongoing Conflicts and India  
*Sharad Srivastava* 163-194

### VOL. 6, NO. 4 WINTER 2011 (OCTOBER-DECEMBER)

1. How to Minimise the Proliferation Impact of Nuclear Deterrence  
*Sverre Lodgaard* 1-28
2. Patterns of Insurgency: Strategies and Doctrines  
*A. V. Chandrasekaran* 29-50
3. Effect of Weather and Terrain on Airlift Operations  
*Ashok K. Chordia* 51-80
4. Training Future Environment Leaders  
*Manoj Kumar* 81-104
5. Political Islam, Democracy and Arab Spring  
*M. R. Khan* 105-128
6. Nuclear Doctrine and Deterrence: A Chinese Perspective  
*S. Rajasimman* 129-152

## INDEX

---

7. The Rise of China and South Korea's Strategic Flexibility  
*Yeon Jung Ji* 153-169

### VOL. 7, NO. 1 SPRING 2012 (JANUARY-MARCH)

1. K. Subrahmanyam and India's Strategic Culture  
*Shri Shivshankar Menon* 1-12
2. The Resurgence of Naxalism: Implications for India's Security  
*S. Adhikari* 13-38
3. New Frontiers of Military Leadership: Environmental Forays  
*Manoj Kumar* 39-58
4. India-Iran Relations Under the Shadow of India-US Strategic Partnership  
*Asif Shuja* 59-76
5. The Need for Strategic Change in Regional Powers'  
Policy Toward Afghanistan for Political Stability  
*K.N. Tennyson* 77-94
6. Rashtriya Rifles in Kashmir: India's Counter-Terrorism Force  
*Debalina Chatterjee* 95-116
7. Shifting Strategies and Tactics of the US/NATO Forces and the  
Taliban in the Present Afghan War  
*Shelly Johny* 117-140
8. Self-reliance and Synergy in Aerospace Sector: The Road Ahead  
*S. N. Misra* 141 -166
9. Air Dominance Over the Oceans  
*Jasjit Singh* 167-188

### VOL. 7, NO. 2 SUMMER 2012 (APRIL-JUNE)

1. India's National Security: Challenges and Issues  
*Shivshankar Menon* 1-14
2. Robotic Air Logistics: A Transformational Capability in Warfare  
*Manmohan Bahadur* 15-32
3. Revolution in Military Affairs  
*Raj Kumar Upadhyaya* 33-48
4. Geo-Political Changes Driving China's Aviation Industry  
*Vishal Nigam* 49-68
5. Decoding Cyber Terrorism: Towards a Culture of International Co-operation  
*M.K. Sharma* 67-88
6. Siting of Indian Nuclear Plants: The Modus Operandi  
*Sitakanta Mishra* 89-120
7. China's Naval Strategy: Strategic Evolution and Emerging Concepts of Warfare  
*Shikha Aggarwal* 121-152
8. India-Iran Relations: Challenges Ahead  
*K.N. Tennyson* 153-172
9. The Fissile Material Cut-Off Treaty: A Debate in Perpetuity  
*Hina Pandey* 173-188

### VOL. 7, NO. 3 MONSOON 2012 (JULY-SEPTEMBER)

1. India-China Relations: Problems and Prospects  
*Kanwal Sibal* 1-26
2. Quality Fundamentals in Support of Air Power  
*P.V. Athawale* 27-54
3. Social Acceptance of Nuclear Power in India  
*Sitakanta Mishra* 55-82

## INDEX

---

4. Nuclear Aspiration as a Hedging Strategy: The Case of Iran 83-106  
*Yeon Jung Ji*
5. China's Tibet Policy: Implications for India 107-124  
*Sana Hashmi*
6. PLA: Military Operations Other Than War (MOOTW) 125-152  
*J.V. Singh*
7. The Umbrella Politics 153-178  
*Debalina Chatterjee*

### **VOL. 7, NO. 4 WINTER 2012 (OCTOBER-DECEMBER)**

1. China in the Twenty-First Century:  
What India Needs to Know about China's World View? 1-16  
*Shyam Saran*
2. A Defining Moment of the Debate: Manned versus Unmanned Platforms of Airpower 17-34  
*Manoj Kumar*
3. Positioning of Israel with its Neighbours and Its Missile Defence System 35-48  
*Indrani Talukdar*
4. Reforms in PLA Training 49-72  
*J.V. Singh*
5. China's Military Space Programme 73-106  
*K.K. Nair*
6. The Politics and Strategy of Environmentalism 107-130  
*Dhanasree Jayaram*
7. Chinese Acupuncture in An Iaf-Paf Face-Off 131-156  
*Vikram Munshi*
8. Nuclear Waste: India's Gordian Knot? 157-180  
*Sitakanta Mishra*

### **VOL. 8, NO. 1 SPRING 2013 (JANUARY-MARCH)**

1. Debating India's Defence Expenditure: Problems and Prospects 1-18  
*Bhartendu Kumar Singh*
2. Nuclear Disarmament and Non Proliferation: The Steps to Global Zero 19-32  
*Stuti Banerjee*
3. Grand Strategic Approach: A Perspective 33-52  
*Prateek Kapil*
4. Dragon's Information Warfare: Implications for India 53-70  
*Raj Mongia*
5. Geostrategic Implications of Environmental Change for Island Nations:  
A Case Study of Indo-Maldivian Equations 71-94  
*Dhanasree Jayaram*
6. Addressing Nuclear Terrorism: An Interdisciplinary Approach 95-116  
*Yeon Jung Ji*
7. Closure of The Strait of Hormuz: Possibilities and Challenges for India 117-136  
*Rhea Abraham*
8. Bhutan and China Relations: It's Impact on India 137-148  
*Indrani Talukdar*
9. South China Sea Imbroglio: An Indian Perspective 149-166  
*Sana Hashmi*
10. Airship: A Viable Airlift Option 167-180  
*Ashok K Chordia*

## INDEX

---

### **VOL. 8, NO. 2 SUMMER 2013 (APRIL-JUNE)**

1. Is India's Nuclear Deterrent Credible? 1-18  
*Shyam Saran*
2. Air Maintenance 2025: Prospects and Limitations 19-34  
*Manmohan Bahadur*
3. PLA Logistics Reforms 35-56  
*J.V. Singh*
4. Examining China's Space Strategy 57-80  
*Manpreet Sethi*
5. China's Readjustment Strategy 81-106  
*Vishal Nigam*
6. Opportunities Unbound: Sustaining Multi-dimensional Indo-Russian Relations 107-126  
*Lunghuiyang Riamei*
7. Iran's Air Power: Is it Powerful Enough for the US? 127-140  
*Indrani Talukdar*
8. Space: The Indian Odyssey 141-160  
*Rajat Jairath*
9. Direction of the Nuclear Dragon 161-180  
*Arjun Subramanian P*

### **VOL. 8, NO. 3 MONSOON 2013 (JULY-SEPTEMBER)**

1. Launch of Air Power Journal (In Retrospect) 1-4  
*D.C. Bakshi*
2. Pakistan's Ideological Slide into Jihad: Consequences And Prospects 5-36  
*Shalini Chawla*
3. India's Cyber Warfare Strategy in Next Decade 37-66  
*M.K. Sharma*
4. Geo-Political Perspective: Tibet 67-92  
*Raj Mongia*
5. Energising Aerospace Industry: A National Security Imperative 93-110  
*Nishant Gupta*
6. Navigating the Arctic: Players From Asia 111-128  
*Ji Yeon-Jung*
7. Nuclear Safety-Security-SafeguardS: The Intricate Interface 129-156  
*Sitakanta Mishra*
8. Geo-Politics and Strategy Formulation 157-172  
*Prateek Kapil*
9. Cyber Warfare and National Security 173-188  
*E. Dilipraj*
10. The Afghanistan Refugee Crisis: Implications for Pakistan and Iran 189-208  
*Rhea Abraham*

### **VOL. 8, NO. 4 WINTER 2013 (OCTOBER-DECEMBER)**

1. Civil-Military Relations: Opportunities And Challenges 1-18  
*N.N. Vohra*
2. National Security And Aerospace Power 19-26  
*Arup Raha*
3. Using Nuclear Weapons First: "A Hell of an Alternative" 27-42  
*Manpreet Sethi*

## INDEX

---

4. India's Ballistic Missile Defence <i>Arjun Subramanian P</i>	43-60
5. Analysis of Plaaf Potential Against India <i>Ravinder Chhatwal</i>	61-90
6. The Daulat Beg Oldi Crisis: Myths, Mistakes and Lessons in Dealing with China <i>Bhartendu Kumar Singh</i>	91-106
7. Israel's Concept of Cumulative Deterrence: Will it bring Peace to the Region? <i>Manmohan Bahadur</i>	107-126
8. The Dynamics of Civil-Military Relations in Israel <i>Lunghuiyang Riamei</i>	127-146
9. Forming India-Vietnam-Japan Trident <i>Ankit Kumar</i>	147-168
10. Myanmar: The new Strategic Pawn in Asia Pacific? <i>Asha Mary Mathew</i>	169-186

### **VOL. 9, NO. 1 SPRING 2014 (JANUARY-MARCH)**

1. Conflicts and Aerospace Power in 21 <sup>st</sup> Century <i>Arup Raha</i>	1 -8
2. Strategic Imperatives of Military Networks: Towards A Credible Military Cyber Power <i>M.K. Sharma</i>	9-30
3. Deterrence and Dissuasion <i>Ashish Singh</i>	31-46
4. IAF's Development Towards Greater Capability: 2032 <i>Vivek Kapur</i>	47-70
5. Transformation of The IAF: Towards Achieving A Greater Role in National Security Dynamics <i>Nishant Gupta</i>	71-94
6. Why is China Exhibiting Belligerent Behavior? <i>Raj Mongia</i>	95-110
7. The Shanghai Cooperation Organisation: Evolution, Contemporary Relevance and Future Trajectory <i>Pravda P.</i>	111-128
8. A Brief Look into Formation of Japan's Defence Policy <i>Prerna Gandhi</i>	129-148
9. Russia's Policy Towards Central Asia in Post-Cold War Era <i>Chandra Rekha</i>	149-174

### **VOL. 9, NO. 2 SUMMER 2014 (APRIL-JUNE)**

1. Coercion and Air Power <i>Manmohan Bahadur</i>	1-32
2. US and Russian Air Bases in Central Asia <i>Vivek Kapur</i>	33-52
4. Cyber Space: Implications for National Security <i>A.k. Tiwary</i>	53-70
5. Ballistic Missile Defence in Asia <i>Arjun Subramanian P.</i>	71-92
6. United States and Pakistan: Nuclear Security Issues <i>Stuti Banerjee</i>	93-112
7. Understanding The Crimean Episode <i>Amarjit Singh</i>	113-132
8. The Irony of China-Japan Relations: Why Do They 'Cooperate' Despite The 'Conflict'? <i>Prerna Gandhi</i>	133-156

## INDEX

---

9. Oman's Strategic Location, Its Foreign Policy and Air Power Capabilities 157-182  
*Indrani Talukdar*

### **VOL. 9, NO. 3 MONSOON 2014 (JULY-SEPTEMBER)**

1. Management of National Security: Some Concerns 1-16  
*N.N. Vohra*
2. Defending The Aircraft Carrier 17-34  
*Pradeep Chauhan*
3. A National Security Strategy for India 35-54  
*Bhartendu Kumar Singh*
4. Air Power: Future Challenges and Emerging Roles 55-78  
*Dhiraj Kukreja*
5. Defence Beyond Design: Towards A New Nuclear Paradigm 79-98  
*Sitakanta Mishra*
6. The INF Treaty: Its Successes, Failures and The Future 99-120  
*Debalina Ghoshal*
7. Terror in the Deep and Dark Web 121-140  
*E. Dilipraj*
8. The Ukraine Imbroglio: Does it Impact India? 141-162  
*Chandra Rekha*
9. Deconstructing Al Qaeda's Terrorist Network in India 163-194  
*Aersh Danish*

### **VOL. 9, NO. 4 WINTER 2014 (OCTOBER-DECEMBER)**

1. Challenges of Air Power 1-10  
*Arup Raha*
2. Counter-Strike: India's Nuclear Strategy 11-34  
*Manpreet Sethi*
3. National Security Scan: Are The Good Days Coming? 35-50  
*P.V. Naik*
4. Attack Helicopters: Where do we use them? Who should use them and for what? 51-72  
*A.G. Bewoor*
5. The Simple Light Fighter Aircraft Reincarnated 73-86  
*Vivek Kapur*
6. India and the "Indo-Pacific" 87-106  
*Prerna Gandhi*
7. Iran's Role in the Energy Security of the Caspian Basin 107-132  
*Ramu C M*
8. Arctic Region: The new Geo-Political Theatre of Russia 133-156  
*Chandra Rekha*
9. Russia in the Arctic: Challenges and Prospects for Tapping Energy Resources 157-182  
*Trivun Sharma*

### **VOL. 10, NO. 1 SPRING 2015 (JANUARY-MARCH)**

1. Changing Nature of War 1-16  
*Shekhar Sinha*
2. Indian Air Power: Its Impact in India's Strategic Neighbourhood 17-40  
*Manmohan Bahadur*
3. Genesis and Early Growth of the Indian Aircraft Industry 41-60  
*Vivek Kapur*
4. The Threat of Nuclear Terrorism 61-80  
*Arjun Subramanian P*

## INDEX

---

5. India's Stand on Internet Governance: Oxymoronic or Opportunistic? 81-98  
*Ashish Gupta*
6. India and the United States: Reinvigorating The 'Energy' Relationship 99  
*Stuti Banerjee*
7. India-US Nuclear Pact: How Strategic Partnership got Entangled in Domestic Politics 121-140  
*Poujlung Gonmei*
8. India's Policy Options to Change Pakistan's Behaviour 145-198  
*Ankit Kumar*

### **VOL. 10, NO. 2 SUMMER 2015 (APRIL-JUNE)**

1. Aerospace Power in the Indian Context of Nation Building 1-20  
*K K Nair*
2. India's Aerospace Footprint in the IOR 21-36  
*R A Maslekar*
3. "Internet Of Things": A New Paradigm for Military Operations 37-56  
*Ashish Gupta*
4. Covert Cyber Capabilities of the US 57-78  
*Dilipraj E*
5. Deconstructing Disaster Management: With Special Reference to Civil-Military Linkages 79-110  
*Nishant Gupta*
6. The Senkaku Islands Dispute and its Implications for the Pacific Island Chains 111-132  
*Amarjit Singh*
7. Solar Powered Aviation: A New Revolution? 133-148  
*R K Narang*
8. The Emergence of the Asian Defence Industry: Are China and Japan Going to Face a War in the 'Business of War' 149-172  
*Perna Gandhi*

### **VOL. 10, NO. 3 MONSOON 2015 (JULY-SEPTEMBER)**

1. Deterrence in Outer Space: The US Way 1-16  
*Manpreet Sethi*
2. Cyber Attacks on Satellites: A Paradigm Shift in Asat Application 17-32  
*P A Patil*
3. Cost-Effectiveness and Utilisation of Air Power in Fourth Generation Warfare 33-58  
*Vivek Kapur*
4. "Design and Make in India": Military Aircraft 59-78  
*R K Narang*
5. Management of Strategic Research and Development in Defence 79-94  
*Sumati Sidharth and Manoj Kumar*
6. The United States and Iran Nuclear Deal 95-110  
*Stuti Banerjee*
7. An Assessment of NPT Review Conference, 2015: Expectations, Obligations, Dilemmas and Opportunities 111-136  
*Hina Pandey*
8. Extra-Regional Powers in IOR: Imperatives for India 137-160  
*Yogesh V Athawale*
9. The Problems with China's Xinjiang Policy: Linkages Between Domestic and External Behaviour 161-180  
*Swati Arun*

## INDEX

---

### **VOL. 10, NO. 4 WINTER 2015 (OCTOBER-DECEMBER)**

1. India's Security Challenges: Role of Aerospace Power Inaugural Address  
By CAS 12Th Subroto Mukerjee Seminar 1-8  
*Arup Raha*
2. Defence Production and Acquisition Policies: Suggestions for a Paradigm Shift 9-36  
*Dhirendra Singh*
3. Indian Military Nuclear Programme: Trajectory and Future Course 37-54  
*Arjun Subramanian P*
4. Role of India, Pakistan, China in Afghanistan Post-US Drawdown 55-80  
*Shalini Chawla*
5. Has The US Administration gone soft on China, Leading to its Rise? 81-110  
*Temjenmeren Ao*
6. Cyber Attacks via Hardware Exploitation: An Insidious and Elusive Menace 111-126  
*Ashish Gupta*
7. Development of the Aerospace Industry in US and USSR/Russia 127-156  
*Vivek Kapur*
8. Human Systems Approach to a More Effective Application of Air Power 157-180  
*M Misra*

### **VOL. 11, NO. 1 SPRING 2016 (JANUARY-MARCH)**

1. China's Major Military Reforms and Their Implications For India 1-16  
*Jayadeva Ranade*
2. South China Sea Dispute: Role of Regional Powers 17-46  
*Sana Hashmi*
3. Building The Case for Sea-Based Nuclear Deterrent 47-64  
*Deep Jyoti Burman*
4. Balancing Make in India: Aerospace Sector 65-82  
*Rajiv Kumar Narang*
5. Cyber Deterrence: Strategic Imperatives and Operational Challenges 83-98  
*Ashish Gupta*
6. Criticality Analysis and Protection of National Critical Information Infrastructures (NCIIS) 99-132  
*MK Sharma*
7. Leadership Challenges in Humanitarian Assistance and Disaster Relief 133-150  
*Rajesh Isser*
8. Indo-Russian Economic Cooperation: The Need for a New Vision 151-180  
*Chandra Rekha*
9. Pivoting the Pacific: Two-Level Games and US Military Presence in Japan and the Philippines 181-201  
*Nidhi Prasad*

### **VOL. 11, NO. 2 SUMMER 2016 (APRIL-JUNE)**

1. The Unfolding Contours of 21St Century Naval Aviation 1-22  
*Arun Prakash*
2. Military Leadership Training: Understanding and Mastering Personal Leadership 23-40  
*S C Mukul*
3. Indian Air Power: Ambitions to Secure Aerospace 41-62  
*Manmohan Bahadur*
4. ISIS: The New Terror 63-84  
*Dhiraj Kukreja*
5. The Rationale for the Indian Nuclear 'Exceptionalism' 85-102  
*Manisha Chaurasiya*
6. Espionage, Intelligence and Exploitation in the Digital Age: Concurrent Manifestations  
Of The Cyber Zeitgeist 103-124  
*Ashish Gupta*



## INDEX

---

7. India's Membership in the Shanghai Cooperation Organisation:  
Opportunities and Challenges 125-144  
*Poonam Mann*
8. Evolution of Russia-China Bilateral Relations 145-177  
*Chandra Rekha*

### **VOL. 11, NO. 3 MONSOON 2016 (JULY-SEPTEMBER)**

1. Energising Indian Aerospace: The Changing Environment 1-8  
*Arup Raha*
2. Cruise Missiles: New Concerns in India's Threat Environment 9-30  
*Manpreet Sethi*
3. Enter The PLA Rocket Force: Assessing China's Missile Capabilities 31-46  
*Ravinder Singh Chhatwal*
4. China's Adiz: Enforcement in East China Sea and Prospects for South China Sea 47-72  
*Tanmay Sharma*
5. On China's Soft Power 73-90  
*Temjenmeren Ao*
6. Disaster Management: Theory, Planning and Preparedness 91-112  
*Rajesh Isser*
7. Technological and Regulatory Challenges in Integration of UAVs in Non-Segregated Air Space 113-152  
*RK Narang*
8. Evolution of IAF Helicopters – I: Inception to 1971 Operations 153-180  
*BS Nijjar*
9. A Paradox of Shifting Sands: India's Relationship With The NPT 181-196  
*Jai Raina*

### **VOL. 11, NO. 4 WINTER 2016 (OCTOBER DECEMBER)**

1. Uri Attack, India's Response: What Next? 1-26  
*Shalini Chawla*
2. The South China Sea: Troubled and Turbulent Waters 27-54  
*Pradeep Chauhan*
3. Development of Aerospace Industry in China and Brazil 55-86  
*Vivek Kapur*
4. Evolution of Iaf Helicopters - II Consolidation Post-1971 War 87-114  
*BS Nijjar*
5. Nuclear Security Summits: Journey so Far and What Next? 115-134  
*Sitakanta Mishra*
6. *Changing Contours of US-Iran Nuclear Relations* 135-158  
*Hina Pandey*
7. Role of The Media in Cultivating Perceptions and Impacting Power Equations:  
Case Study of US Psyops 159-179  
*Kriti Singh*

### **VOL. 12, NO. 1 SPRING 2017 (JANUARY-MARCH)**

1. China's Rise and Future Trends in Sino-Indian Relations 1-16  
*Jayadeva Ranade*
2. South China Sea: An Area of Claims and Counter-Claims 17-36  
*Dhiraj Kukreja*
3. Cyber Space: Reshaping The Contours of International Politics 37-56  
*Ashish Gupta*
4. Trends in The Russian Economy 57-70  
*Arun Mohanty*

## INDEX

---

5. Trust and Big Data in Coordinating Disaster Response 71-96  
*Rajesh Isser*
6. Analysis of Iran-China Relations 97-116  
*Anu Sharma*
7. Analysis of the American Action Plan for a New Middle East 117-140  
*Amarjit Singh*

### **VOL. 12, NO. 2 SUMMER 2017 (APRIL-JUNE)**

1. Does Higher Defence Organisation in India Require Major Surgery? 1-18  
*Vinod Patney*
2. China's Military Reforms 19-42  
*SL Narsimhan*
3. Aerospace Power and Foreign Policy: Global and Indian Scenarios 43-62  
*SC Mukul*
4. Unmanned Aerial Vehicles in National Air Space 63-86  
*Manmohan Bahadur*
5. Indigenisation of UAVs by India and its Challenges 87-134  
*RK Narang*
6. Joint Helicopter Operations: A Pragmatic Approach 135-164  
*BS Nijjar*
7. Back to the Future: An Analysis of the Comprehensive Convention on International Terrorism 165-188  
*Jai Raina*

### **VOL. 12, NO. 3 MONSOON 2017 (JULY-SEPTEMBER)**

1. First BK Nehru Memorial Lecture 1-14  
*NN Vohra*
2. Nuclear Proliferation from Pakistan: A Peep into the Past and Implications for the Future 15-34  
*Manpreet Sethi*
3. China in the Asia-Pacific: Rising Opportunities, Deepening Concerns 35-50  
*Sana Hashmi*
4. China's Western Theatre Command: Implications for India 51-70  
*Temjenmeren Ao*
5. Analysis of Permanent Court of Arbitration's Verdict on the South China Sea 71-88  
*Pooja Bhatt*
6. What If? Analysis of Military Decisions 89-106  
*Bharat Kumar*
7. Operation Cactus: Some Parallels 107-130  
*Ashok K Chordia*
8. Cyber Vigilantism, Terrorism and Guerrilla warfare: New Challenges, New Perspectives 131-152  
*Ashish Gupta*
9. ISIS and Its Presumed Expansion into Central Asia: Implications for India 153-171  
*Poonam Mann*

### **VOL. 12, NO. 4 WINTER 2017 (OCTOBER-DECEMBER)**

1. Pakistan's Non-Traditional Security Threats 1-26  
*Tilak Devasher*
2. Integrated Theatre Commands: Does the Idea Suit India? 27-42  
*Ramesh Rai*
3. Integrated Operations: More than Jointmanship 43-64  
*Ashminder Singh Bahal*
4. Combating Hybrid Threats: A Holistic Strategy 65-82  
*Arjun Subramaniam and Naishad Purohit*

## INDEX

---

- |  |         |
|--|---------|
| 5. Cyber Astuteness: An Elusive Enabler of Military Dominance<br><i>Asheesh Shrivastava</i>                | 83-108  |
| 6. Thinking Strategically<br><i>Ashish Singh</i>   | 109-132 |
| 7. India's Hydrocarbon Policy: Diversification, Diplomacy and Deals<br><i>Sai Deepthi Pavani</i>           | 133-154 |
| 8. Evolution of US Policy on Climate Change: From President Obama to President Trump<br><i>Ishka Yadav</i> | 155-179 |



# CENTRE FOR AIR POWER STUDIES RESEARCH FELLOWSHIPS – 2017-2019

Centre for Air Power Studies (CAPS), New Delhi, invites applications from Indian citizens for two years research fellowship, at four levels:

1. **Senior Fellow (SF):** PhD with 05 years of experience in research or 15 years experience in defence; remuneration-Rs 40,000-46,000.
2. **Research Fellow (RF):** PhD or 10 years experience in defence; remuneration-Rs 30,000-36,000
3. **Associate Fellow (AF):** MPhil or equivalent with 03 years of experience in research or 05 years experience in defence; remuneration-Rs 22,000-27,000
4. **Research Associate (RA):** MA/MSc and reading for MPhil/PhD; remuneration-Rs 18,000-22,000.

## Procedure

Duly filled-in application along with the research proposal of not more than 1,000 words must be sent to **Director General, Centre for Air Power Studies (CAPS), P-284, Arjan Path, Subroto Park, New Delhi 110010** or by email at [capsnetdroff@gmail.com](mailto:capsnetdroff@gmail.com) with the subject line 'Application for the position of SF/RF/AF/RA.'

The application form and research proposal format can be downloaded from <http://capsindia.org/vacancy>.

For more details, visit us @ [www.capsindia.org](http://www.capsindia.org)

## RESEARCH AREAS

- National Security
- Strategic Studies
- Foreign Policies
- India and the Neighbourhood
- Aerospace
- Nuclear
- Space and Cyber Issues
- Energy.

## JOB REQUIREMENTS

- Research experience
- Excellent communication skills, including inter-personal, oral and written communication skills
- Proficient in Microsoft Office applications.
- Able to multi-task, work under pressure and meet deadlines.

# NOTES FOR CONTRIBUTORS

Articles submitted to *Air Power Journal* should be original contributions and should not be under consideration for any other publication at the same time. If another version of the article is under consideration by another publication, or has been, or will be published elsewhere, authors should clearly indicate this at the time of submission.

Each typescript should be submitted in duplicate. Articles should be typewritten on A4/ Letter paper, on one side only, **double-spaced (including the notes)** and with ample margins. All pages (including those containing only diagrams and tables) should be numbered consecutively.

There is no standard length for articles, but 5,000 to 8,000 words (including notes and references) is a useful target. The article should begin with an indented summary of around 100 words, which should describe the main arguments and conclusions of the article.

Details of the author's institutional affiliations, full address and other contact information should be included on a separate cover sheet. Any acknowledgements should be included on the cover sheet as should a note of the exact length of the article.

All diagrams, charts and graphs should be referred to as figure and consecutively numbered. Tables should be kept to a minimum and contain only essential data. Each figure and table must be given an Arabic numeral, followed by a heading, and be referred to in the text.

Articles should be submitted on high-density 3~ inch virus free disks (IBM PC) in rich text format (RTF) together with an **exactly matching double-spaced hard copy** to facilitate typesetting; notes should be placed at the end of each page. Any diagrams or maps should be copied to a separate disk separately in uncompressed TIF or JPG formats in individual files. These should be prepared in black and white. Tints should be avoided, use open patterns instead. If maps and diagrams cannot be prepared electronically, they should be presented on good quality white paper.

Each disk should be labelled with the journal's name, article title, author's name and software used. It is the author's responsibility to ensure that where copyright materials are included within an article, the permission of the copyright holder has been obtained. Confirmation of this should be included on a separate sheet included with the disk.

Copyright in articles published in *Air Power* rests with the publisher.

## STYLE

**Authors are responsible for ensuring that their manuscripts conform to the journal style.** The Editors will not undertake retyping of manuscripts before publication. A guide to style and presentation is obtainable from the publisher.

Current Journal style should be followed closely. Dates in the form January 1, 2000. Use figures for 11 and above. British spellings are to be used. Authors should provide brief biographical details to include institutional affiliation and recent publications for inclusion in *About the Contributors*. Sub-headings and sub-sub-headings should be unambiguously marked on the copy.

## NOTES

Notes should be **double spaced** and numbered consecutively through the article. **The first line of a note must align with subsequent lines. Each note number should be standard size and have a full point.**

- a) References to books should give author's name: title of the book (*italics*); and the place, publisher and date of publication in brackets.  
e.g. 1. Samuel P. Huntington, *The Common Defense* (NY: Columbia UP, 1961), Ch. 2, pp. 14-18.
- b) References to articles in periodicals should give the author's initials and surname, the title of the article in quotation marks, title of the periodical (*italics*), the number of the volume/issue in Arabic numerals, the date of publication, and the page numbers:  
e.g., Douglas M. Fox, "Congress and the US Military Service Budgets in the Post War Period," *Mid-west Journal of Political Science*, vol. 16, no. 2, May 1971, pp. 382-393.