CASS JOURNAL

NATIONAL SECURITY NATIONAL DEVELOPMENT

CENTRE FOR ADVANCED STRATEGIC STUDIES

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THE CENTRE FOR ADVANCED STRATEGIC STUDIES

The Centre for Advanced Strategic Studies (CASS), Pune was registered on 21 September, 1992 under the Society's Registration Act, 1860, and as a Charitable Public Trust on 28 October, 1992, under the Bombay Charitable Public Trust Act of 1950. The Department of Scientific and Industrial Research, Ministry of Science and Techonology, Government of India accorded recognition to the Centre as a scientific and industrial research institution. The Centre has also been granted exemption U/S 80G of the Income Tax Act, 1961, which gives fifty percent exemption to donors.

The Centre aims to undertake research and analysis of subjects relating to national and international security and development through seminars, discussions, publications at periodic intervals and by close interaction with the faculty members and research students in allied disciplines in universities and educational institutions as well as the armed forces. In the near future, the Centre expects to award research fellowships for studies in various areas of national security and national development. It aims to generate and promote interest among academicians and the public in related subjects, with a view to increasing awareness about national security concerns. It has received very valuable support from the University of Pune in all its activities, especially from the Department of Defence and Strategic Studies. It has signed a Memorandum of Understanding (MOU) with the Yashwantrao Chavan Academy of Development Administration (YASHADA), Pune for mutual collaboration in academic activities. The Centre has hosted a number of seminars, panel and group discussions in the past. The Centre has also embarked on publishing a Quarterly Journal with effect from January 2014.

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Dr. A.P.J. Abdul Kalam
Former President of India

10, Rajaji Marg
New Delhi-110011

Message

I am happy to know that the Pune based Centre for Advanced Strategic Studies is launching a Quarterly Journal on the important interlinked theme of '*National Security and National Development*'. No country can aspire to develop economically, socially and culturally unless borders are secure and there is no internal strife. Environmental degradation, shortages of food, water and energy are some of the many other issues, which give new dimensions to the non-traditional security for our country. At the same time to ensure an indigenous capability to enable comprehensive security, the country must have a strong academic foundation and capability to innovate. As such there are many interdependent facets of these important issues, which need discussions, writings and policy formulation.

India has a rich history and the legacy inherited from our heritage needs to be revisited to draw inspiration for the younger generations. I urge the Centre for Advanced Strategic Studies to involve youth, the human wealth of our country in various programmes and writings so that the message remains contemporary and positive. The ignited minds of the youth are the most powerful resource on earth, above the earth and under the earth.

I extend my greetings and best wishes to the Centre for Advanced Strategic Studies, Pune on the launch of their Quarterly Journal.

26 November 2013

(APJ Abdul Kalam)

Admiral (Retd) JG Nadkarni,
PVSM, AVSM, NM VSM
President, CASS

Centre for Advanced Strategic Studies
Pune University Campus
Ganeshkhind Road
Pune 411 007, INDIA

Message

As a founder member and the first Director of the Centre for Advance Strategic Studies, it gives me immense pleasure in sending my greetings to all the contributors and readers of the Quarterly Journal, a new endeavour initiated by the Centre.

In the past 21 years, the Centre has laid strong foundations, due to which new projects such as this journal have become feasible. It is a welcome step and I am certain that in the near future some seminal issues will be brought out in print by the Centre. This will not only ensure wider awareness, but will also help in identifying some constructive suggestions for the policy makers. In this context, I am happy to note that the journal will cover a wide range of topics, which have bearing on "National Security and National Development".

I wish the authors, readers and all members of the Centre for Advance Strategic Studies success in their future endeavours.

Happy New Year

05th December, 2013

(JG Nadkarni)
Admiral (Retd)
Former CNS

Air Marshal (Retd) BN Gokhale
PVSM, AVSM, VM
Director, CASS

Centre for Advanced Strategic Studies
Pune University Campus
Ganeshkhind Road
Pune 411 007, INDIA

Editor's Note

"*Once you start working on something, don't be afraid of failure and don't abandon it. People who work sincerely are the happiest.*"

– Chanakya

It is my privilege to write this Editorial Note for the inaugural issue of the Quarterly Journal initiated by the Pune based Centre for Advanced Strategic Studies. Having been established in September 1992, this multi-disciplinary Centre has vast expertise in hosting lectures and seminars in which eminent experts from various fields participate regularly.

Publishing of the Quarterly Journal is a new endeavour being undertaken by the Centre with the interlinked theme of "National Security and National Development".

We, at the Centre, are extremely honoured in having received a very encouraging message from the former President, HE Dr. A.P.J. Abdul Kalam. In our future issues of the Journal, we will endeavour to incorporate his advice regarding participation by students and young leaders of tomorrow.

The Centre has been very fortunate in having received enthusiastic support from esteemed authors who, despite their busy schedule, have contributed their articles for the inaugural issue. On behalf of the Centre I wish to express my gratitude to them.

As we progress, apart from the Quarterly, the Centre also aims to publish 'issue based' journals at random intervals. These will focus on diverse areas in the realm of both traditional as well as non-traditional
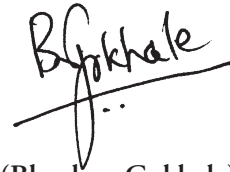
security, which in turn impact national development. This will give experts in different fields an opportunity to bring forth issues of national importance.

The Centre will endeavour to reach out to the policy makers on the one hand, and to youth on the other, who can contribute fresh ideas and suggestions to bring about positive changes in the areas of concern. In this connection, a quote from the former US President Franklin Roosevelt is worth repeating, "We may not be able to prepare the future for our children, but we can at least prepare our children for the future." To accomplish this together, we look forward to receiving similar enthusiastic support by experts as well as readers.

Happy reading and Happy New Year

Jai Hind

05th December 2013

(Bhushan Gokhale)
Air Marshal (Retd)
Director, CASS

Science and Security

Shri Shivshankar Menon

Science and technology have always been a major factor in the security calculus through the ages. This is as true of warfare as it is of security broadly defined. Its significance has only grown since the industrial revolution began. But its significance has changed over time. Besides, the relationship between science and security is seldom linear or predictable. I therefore thought that I would like to briefly elaborate on science and technology in war, on war in the age of modern technology, and on technology and security. Finally, we might look at where India stands today.

S&T in War

Science and warfare have always been intimately connected. That technology is critical to war is now widely recognized and military historians today define the ages of warfare by technological change, rather than by the great generals or leaders associated with them. We now speak of the age of gunpowder, of industrial war, of the atomic age and of modern war in the age of electronics or the age of systems.

This is not a new or post-industrial revolution phenomenon, though the pace of change has certainly accelerated in the last three centuries. In antiquity, the invention of the stirrup and the high saddle in Asia, when combined with the horseshoe, of unknown origin, and the compound bow, enabled cavalry to dominate the battlefield that previously belonged

to infantry with edged weapons, as the 12th century Mongols showed to deadly effect. Of course the limitations of cavalry, that it could not hold ground or reduce fortifications, meant that infantry adopted new roles. From the 12th century until the end of the 17th century the proportion of cavalry to infantry in most successful armies, whether in Europe, India or China was steady at around 1:2, until the musket, bayonet and flintlock increased infantry firepower, decimating cavalry and changing the ratio back to something like 1:5.

That was only one of the changes that gunpowder brought to warfare. Once gunpowder could be used as a propellant for cannon balls breaking down castle walls, tactics and strategy changed, as did the composition of armies, which now needed trained professionals rather than farmers as part-time soldiers. By the 17th century personal firearms extended the technology of gunpowder, making it more mobile and making the individual infantryman an instrument of firepower in his own right. When combined with the logistics revolution that long distance navigation, and soon the telegraph and mass production and railways made possible, we saw an age of industrial war by European nations against the non-industrial world from the 19th century onwards and against each other in the twentieth century.

I will not labour the point. Examples of such change, of revolutions in military affairs as a result of the adoption of new technologies – gunpowder, navigation, radio, atomic energy, and electronics – are myriad and well known to military men, though not part of our science history curricula in schools and universities.

Incidentally, each time a new technology arrives, human reactions have been very similar. When the Spartan king Archidamus saw for the first time a weapon that could shoot darts through the air he reacted with alarm. "O Hercules", he is said to have exclaimed; "the valour of man is at an end". As you know he was a bit premature. When the crossbow was reinvented in Europe in the 11th century, men marveled at its murderousness. Attempts were made to have it banned and declared fit for use only against heathens! There are a deep roots for many technology control and denial regimes that we see in the modern world.

The interesting question, however, is why even identical implements and technologies have been understood and used in entirely different ways in the hands of different societies. Gunpowder was known and used in China from the 7th century onwards, but was only harnessed for warfare

effectively towards the end of the 14th century, first in West Europe and then by the Mughals and others, long before China did so. Steel was manufactured in blast furnaces in China around 800 AD, thereafter in India, and in Western Europe after 1300 AD but was effectively applied for the manufacture of weapons in the Levant and Europe and not East Asia. Clearly science and technology is a necessary condition, but not a sufficient condition for enhanced military effectiveness.

To my mind the determining element was the human factor, the choices made by the elite responsible for military decisions. Those choices were guided by their social and cultural milieu, or from what we would now call their strategic culture. What do we mean by strategic culture? We mean the influence of our ideological and mental training and upbringing and the ways of thinking that we normally take for granted. I know that this is not an easy idea for scientists who are trained to think of a universal scientific method, which produces reproducible results irrespective of the country, culture or gender of those who carry out an experiment. But ask yourselves why certain countries, say India and Russia, for instance, consistently produce mathematicians of the highest quality. Or, why a generation of path breaking nuclear physicists came from not just one country but one high school. While science itself is value neutral and culture free, technology, the choice of what to study, and how to apply science is not. It is the result of individual choices that reflect their milieu and upbringing.

It is that relationship between strategic culture and available technologies produced by science that determines not just the manner in which technologies are applied to war, but the changes in tactics, strategy and what the Russians call the operational art. Often, this goes beyond the military to the nature of society itself.

Let me describe an example of what I mean. Around 1800 BC the light chariot first made its appearance. It was an expensive and complex piece of military equipment, and when combined with the compound bow it could overrun all known opposition on even ground. But the same technology had very different effects in various societies that adopted it. Where its ownership was private, as in Homeric Greece and through Persia to India, the light chariot gave rise to warrior aristocracies. Remember the *Mahabharata*. Where its ownership was public, the light chariot helped to establish and maintain a strong centralised government, like that under Rameses in New Kingdom Egypt.

Industrial War

The industrial revolution brought total war, an era of mass industrialised warfare where quantity was quality. The highly skilled German war machine was overwhelmed in WWII by the material superiority of its opponents. This is an oversimplification but true enough for our present purposes.

The industrial revolution also established the idea of military invention as a permanent and systematic feature of modern war. Not just the invention of new weapons which happened through the ages. The difference was the sustained conduct of military research with state support to take advantage of rapid technological change. One only has to remember early research in radar, aeronautics, space science, and atomic energy to see how war drove the state to support basic research. As a result, the relationship between state and industry, and between the state and research became increasingly close, particularly during WWII and the Cold War. From the 1940s until the seventies, military R&D led rather than followed the ideas of industry in critical sectors like electronics and aerospace. If not for this, computers would probably have come some twelve to fifteen years later, as also the first integrated circuits which led to the information revolution. After all the internet was first conceived in the sixties as a "post apocalyptic command grid" – as a means of maintaining strategic military communication in the event of a surprise nuclear attack.

War in the Age of Technology

As a result of that spurt in scientific research we have moved beyond industrial war to war in the age of modern technology. If war was industrialised in the 19th and 20th centuries, it has since evolved further with the development of nuclear weapons, and then again with the creation of a whole new domain of contention in cyber space by information and communication technology.

The creation of nuclear weapons by atomic physicists brought into being weapons of such unimaginable power that they changed the way in which we thought of war in the previous centuries. The atomic military revolution required the development of a doctrine and a force capable of using technology in a new, innovative and unexpected way. The power of these weapons made war between super-powers irrational under all, but the most extreme circumstances. As Bernard Brodie explained in 1946,

conventional military wisdom in the form of the principles of war simply did not apply in the nuclear world. Surprise and concentration of force no longer guaranteed victory. The nuclear era was therefore an era of the wars of decolonisation or national liberation, of small wars, for the most part involving proxies rather than direct contention between the great powers, as was the earlier norm in wars of the industrial age before 1945.

Before the advent nuclear weapons, the main purpose of military establishments was to win wars. After nuclear weapons, the main purpose of military establishment was to prevent them. And this was to be done through deterrence, by threatening unacceptable damage upon an enemy who might attempt to win a nuclear exchange. This was paradoxical. In order to prevent the use of nuclear weapons, the adversary had to be convinced of the certainty of their use against him. The development of the deterrence theory, different from earlier versions of dissuasion or coercion, and its ramifications, including game theory and other refinements, was a direct result of the development of nuclear weapons. Since deterrence is sensitive to technological change, it therefore sustained military R&D efforts right through the Cold War.

There were of course problems with reliance on deterrence. What if some possessor of nuclear weapons did not understand that these weapons were not meant for use, or as war fighting weapons? Fortunately, nuclear weapons were the products of big science, requiring heavy capital investments and large and complex facilities. They were therefore in the hands of states. They have stayed there despite determined efforts by terrorists and others to get their hands on them. As a result, it has been possible to deal with proliferation of nuclear weapons and their limitation through inter-state mechanisms like the IAEA, the NPT and so on.

ICT

If nuclear weapons were the result of big science, the ICT revolution is not. Many recent technologies that have carried forward the ICT revolution and its military applications, are the result of private research and entrepreneurship, of small science, unlike the Cold War pattern of military led and state organised or conducted research. Today, the role of the state in new areas has shrunk to being a facilitator and provider of funds. The products of many of the new technologies are made in what would have been called the handicraft industry in the past, not large military industrial complexes. I am told that this is even more true of

the next generation of technologies in new materials, nanotechnology, genetics and biochemistry.

Where nuclear weapons placed unimaginable power in the hands of possessor states, the ICT revolution has brought power into the hands of small groups and individuals, and made the state's control over its physical borders irrelevant, while creating a whole new domain for contention in cyber space. The state's legal monopoly of violence, long a fiction in practice, has now been exposed. And the new information and communication technologies promote alternative forms of war. By enabling and empowering individual communications and small group operations, these technologies make guerrilla warfare and sub-conventional conflict more likely, as also the use of asymmetry and deception, and conflicts at the lower end of the spectrum of violence.

Many habits of thought that we learnt in the nuclear age, are now being stood on their head as a result of the ICT revolution's effects. When attacks in cyber space are close to the speed of light, conventional deterrence can barely operate, and there is a clear premium on offense rather than defence. Cyber space is a borderless, anonymous and anarchic domain, where it is hard to ascribe an origin or source to attacks and other malicious activities.

The other new domain of contention that science has created is outer space which is increasingly being used for military purposes.

Technology and Security

It is clear that war is now completely permeated by technology and is even governed by it. At the same time, technology has also changed the way in which we define security and think about it. Today, we cannot consider national security without considering cyber security, and we look increasingly to technology for solutions for internal security issues. If we have had some success in intelligence based counter-terrorism operations recently, it is due in part to a combination of technological methods, including data fusion, with traditional intelligence trade craft.

As we urbanise our societies, technology becomes ever more important for policing and law and order. For the first time in history, half the world's population now lives in cities. India too is rapidly moving in that direction. Internal security in these situations, when aspirations and expectations have been aroused, will be achieved only if we are successful in finding technology based solutions.

Besides, in the borderless world that ICT has created, we now have no choice but to benchmark our domestic security efforts and institutions to international standards.

In fact, I would go further and say that it is time that we started thinking about India's technology security. This would involve not just our possession of and access to technology, but also our ability to innovate, generate technology and, most important, to use it and apply it in creative ways for solutions to our problems.

INDIA

In one sense, military and security technology is evolving towards India's strengths. The changes that I have described, from big, capital intensive state conducted science to the kind of knowledge intensive work that has resulted in the ICT revolution, and the new domains in cyber space and outer space, create areas that we should find comfortable to operate in. The question is, how can we best organise ourselves to exploit these opportunities. To me it seems that if we are to produce technologies and outcomes that India's national security requires, traditional ways in which we have organised our scientific efforts in India will need to change, or at least be considerably supplemented. We need much stronger links between scientists and the services, and we need to break down the vertical silos in which we operate today.

It is not for me to predict how future wars might be waged, or how technology will evolve. Possible changes in war by the use of new materials, genetics, or nanotechnology are mind boggling. But, I think it is certain that modern technology will play an increasingly important role in our security calculus. It has already made armies, wars, and their effects increasingly complicated and unpredictable. India is fortunate in having a cohort of world class scientists and a series of governments supportive of scientific research in the country. I am sure that Indian science and technology will make its contribution for the defence and security of India in this new age when science and technology are one of the most important pillars for India's security.

Shri Shivshankar Menon

Shri Menon is National Security Advisor to the Prime Minister of India since 23 January 2010.

Shri Menon was previously Foreign Secretary of India from October 2006 to August 2009. He has served as Ambassador and High Commissioner of India to Israel (1995-97), Sri Lanka (1997-2000), China (2000-2003) and Pakistan (2003-2006). He has been a member of the Atomic Energy Commission since 2008.

A career diplomat, he served in China (thrice), in Japan and in Austria in the Embassy and the Mission to the IAEA and the UN. He was seconded to the Department of Atomic Energy in the early eighties. His professional experience includes India's relations with her neighbours, atomic energy and disarmament issues and India's relations with the major powers.

Menon speaks Chinese and some German. He is an MA in ancient history from Delhi University.

He is married to Mohini and has two children.

Climate Science
Challenges

Dr. R. Chidambaram

Introduction

I have often said that "National Development and National Security are two sides of the same coin" and that "National Security is not just military security, but should include energy security, water security, food and nutritional security, and environmental security". Environment obviously includes climate, and, in recent years, investigation of climate change threat has become an integral part of climate science.

The prediction of weather and the study of climate, have always constituted some of the greatest challenges in science. Furthermore, as the Monograph (Attri & Tyagi, 2010) entitled "*Climate Profile of India*" of the Indian Meteorological Department (IMD) says: "India is home to an extraordinary variety of climatic regions, ranging from tropical in the south to temperate and alpine in the Himalayan north, where elevated regions receive sustained winter snowfall…. The average rainfall is less than 13 cm over western Rajasthan, while Mausiram in the Meghalaya has as much as 1141 cm."

The strong dependence of the economy on the monsoons has kept our climate scientists in permanent public focus. I am very happy that ESSO (Earth System Science Organization) – MoES (Ministry of Earth Sciences) has very recently started a ₹ 400-crore Monsoon Mission, whose

primary objective is to improve monsoon prediction on all time scales. The Mission will also support atmospheric and ocean observational programmes over the South Asian region, to obtain a better understanding of the physical processes of the South Asian monsoons.

When an awesome tragedy like the recent one in Uttarakhand happens, there is speculation as to whether this was caused by climate change. Of course, it is generally believed that climate change will lead to an increase in the frequency and intensity of extreme events. Global averages of the effects of climate change are pointers, but populations in any vulnerable region are interested in the local impact of climate change and how to adapt to it. Talking of averages, there is the story of a man who drowned in the deep end of a swimming pool, whose average depth was only two feet! Capabilities for high resolution modelling are, therefore, important. Vulnerable regions may perhaps require modelling for a grid size as low as 15 km by 15 km. The ITM (Institute of Tropical Meteorology) model under development uses state-of-the-art ocean-atmosphere coupling methodology. The Climate Change Centre at ESSO-ITM is participating in the internationally-coordinated CORDEX (Coordinated Regional Climate Downscaling Experiment, South Asia) experiment, which attempts high-resolution regional-scale climate change projections. Operational short-range and medium-range forecasts are also generated at ESSO-IMD and at ESSO-NCMRWF (National Centre for Medium Range Weather Forecasting).

I remember visiting some years back the Earth Simulator of the Japan Meteorological Agency, where they were using a 130 Teraflops supercomputer. Such computers are available to our climate scientists in India today; I understand that the MoES has recently acquired a petaflop computer which will be commissioned by the end of the year.

Remote access to a supercomputer resource has been made easier by the National Knowledge Network (NKN), a multi-gigabit per sec, low-latency, scalable all-optical fibre network, planned to connect 1500 knowledge institutions (universities and national labs)—the National Informatics Centre (NIC) is the implementing agency for the project and has done an excellent job; about 1100 institutions are already connected. All the institutions of MoES are connected. One of the model projects of the NKN is the Grid for Climate Change, operated by the MoES. NKN enables fast access not only to remote supercomputers, but also to remote databases. So much data is available today that we must develop computational techniques for remotely accessing and optimally utilizing

them. Climate science research is definitely an area of big data science, which is gaining prominence.

More and more accurate data must be generated, capturing all recent developments in observational techniques, both from over land and from over sea – data, which are needed both for regional modelling and global modelling, as well as to provide climate-related services.

The present observational network of IMD is already quite extensive and consists of surface observatories, rain gauges, radiosonde, pilot balloon stations and Doppler Radar stations. This network is being further augmented and modernized. ESSO-INCOIS (Indian National Centre for Ocean Information System) carries out observations over the Indian Ocean by deploying platforms like ocean buoys, ARGO floats, etc., and provides operational information for potential fishing zones, ocean state forecasts, marine meteorological advisory services and other value-added and web-based ocean information services. ESSO-INCOIS also hosts the important Tsunami Warning System and disseminates warnings to the concerned organizations.

The Indian Space Research Organisation (ISRO) can provide, and has been providing satellite remote sensing data relevant for climate change. They have estimated that their data are of relevance to six out of the eight missions in the National Action Plan on Climate Change, released by Prime Minister Manmohan Singh in 2008. Two of the satellites built jointly by ISRO and the French Space agency CNES and launched by the Polar Satellite Launch Vehicle (PSLV) of ISRO are MEGHA-TROPIQUES (mass 1000 kg, meant for studying the water cycle and energy exchanges in the tropics—launched in Oct 2011) and SARAL (mass 410 kg, meant for oceanographic studies viz. marine meteorology, sea state forecasting and climate monitoring—launched in Feb 2013).

Climate science is an area which requires intense scientific collaboration. ESSO-MoES and the UK's Natural Environment Research Council (NERC) have an MoU for joint research on earth sciences; there is a recent joint initiative for collaborative research on the monsoon, with special emphasis on observational campaigns to understand the physical processes involved and their linkage to large-scale circulation variability.

I was in Oak Ridge National Lab, US, in July 2013 and was shown some excellent work by the group led by Dr. Steven Fernandez on visualization of the impact of climate change; ORNL has one of the biggest computer clusters in the US with a total capability of 47 petaflops. They also projected on a wide screen, the size of a wall of a big room,

population migration possibilities in the wake of an extreme event in India caused by climate change. Urban science is an important field of study today. There will be significant impact of climate change on our water resources, on our agriculture and other sectors, which have to be studied and solutions found.

Sustainable Development with Equity

We all want sustainable development, but we also want sustainable development with equity. The ultimate equity, in the context of the climate change threat, is equal to the per capita carbon-dioxide emission entitlement for everyone in the world. As Prime Minister Manmohan Singh said at the G8+ meeting in Heilegendamm in 2007, the per capita CO_2 emissions in India, which are very low compared to even the global average, will inevitably go up as the country develops. Developed countries must bring down their per capita CO_2 emissions; we can only assure that our per capita CO_2 emissions will never exceed theirs. Once the twain meet, we can keep bringing down together the per capita CO_2 emissions on the basis of new technologies, in the development of which India will be more than happy to participate. This I think is a very equitable proposal. This is what the phrase "common but differentiated responsibilities" is all about. Of course, we will meanwhile bring down the CO_2 emission intensity (i.e. on per unit GDP basis) using best available technologies; the developed countries have the responsibility of transferring such technologies to the developing countries, who are in fact likely to be more affected than the Annex-1 countries by climate change. Incidentally, I came across a National Geographic study in 2008, which found that Indians are among the world's greenest consumers!

In a recent lecture (29 August 2013) I heard in the Asian Science Camp in Tsukuba, Japan by Dr. Y.T. Lee, current President of the International Council on Science (ICSU), where he quoted Mahatma Gandhi ("There is enough in the world for everyone's need but not for everyone's greed") and said that if everyone in the world starts consuming like the Americans, the world will need five-and-a-half times the available global natural resources.

Climate Change—Present Status

Though the rate of warming over the 15-year period (1998-2012) at 0.05 deg C per decade has been found to be smaller than the trend over

the longer period 1951-2012, which is at 0.12 deg C per decade, the latest Fifth Assessment Report of the International Panel on Climate Change (IPCC, chaired by Dr. R.K. Pachauri), released in the last week of September 2013, states that there is now a 95 percent probability (a five percent increase from the 2007 Report of the IPCC) that global warming is caused by humans.

I think that an overwhelming majority of scientific opinion is that global warming cannot be explained as a result of internal variability and without bringing in external forcing factors. Of course, better modelling of the entire earth system, including behaviour of aerosols, would be required. At ESSO-ITM, research on atmospheric aerosols is being pursued for many years, based on observations using LIDARS, photometers and other experiments, to characterize physical and radiative properties of aerosols over the region. The Cloud Aerosol Interaction and Precipitation Experiment (CAIPEEX) conducted by ESSO-ITM during 2009-11 provided the first opportunity to our climate scientists to study droplet formation and rain drop formation in monsoon clouds, and to analyze how aerosol pollution may influence these processes.

The IPCC Reports and conclusions are valuable and are the result of enormous efforts by hundreds of climate scientists; though very rarely an error does creep in, like the conclusion that Himalayan glaciers would melt completely by 2035. The Editorial in the special issue on climate change in *Nature* dated 18 September, 2013, while appreciating "the depth and breadth of the IPCC's regular reports… with a truly breathtaking array of data', suggests that "IPCC's mega-assessments are out of date by the time they hit the streets" and that "climate scientists should focus on smaller and more rapid assessments of more pressing questions".

Sea-level rise is an important issue for low-lying island states and for low-lying coastal regions of bigger countries, including India. I understand that IPCC's 2013 Assessment Report predicts a global mean sea-level rise of between 26 cm and 82 cm by 2100 (a substantial increase over the 2007 Report). I also saw in a recent special issue of *Nature* I referred to earlier, that a physical oceanographer Stefan Rahmstorf from the Potsdam Institute favours "semi-empirical models" over "process models"; since the former do not require complete understanding of the processes involved, but are compatible with past data. Of course, simultaneously it is very important to study deeply and understand better the fundamental physical processes driving climate variability.

Himalayan Glacier Research is extremely important for us. In

2011, we brought out a report on Himalayan glaciers by a study group established by our office, which had deliberated for two or three years on this topic. There is also a mission, coordinated by the Department of Science and Technology in the National Action Plan on Climate Change, on "Sustaining the Himalayan Ecosystem".

"Atmospheric Brown Clouds (visible areas of brown coloured atmosphere) are not made up of water vapour like regular clouds. They are mostly made up of… aerosols, which consist of sulphates, nitrates, black carbon, hundreds of organic compounds, and fly ash." …This quote is from a report of UNEP and NORA (National Oceanic and Atmospheric Administration of the US).

I remember hearing an interesting scientific discussion on the significance or otherwise of black carbon in a meeting arranged by Mr. Jairam Ramesh when he was the Minister for Environment and Forests, in which Dr. V. Ramanathan from the Scripps Institute of Oceanography and Prof. J. Srinivasan of the Indian Institute of Science and others debated this issue. The impression I then got, and continue to have now, is that there is very large uncertainty in the quantification on the effect of black carbon aerosols on Indian monsoons and on melting of glaciers. I also understand that the reports on the impact of black carbon are mutually contradictory. Many of them in fact look less scientific evidence-based and more motivated, to make black carbon significantly culpable for global warming (and *ipso facto* developing countries); along with carbon-dioxide (most of whose emissions, current and historical, have been from the Annex-1 countries listed in the Kyoto Protocol). Black carbon aerosols, as we know, arise from incomplete combustion of fossil fuel, burning of biomass for cooking and burning of crop residues, apart from wild fires in forests, etc.

Then there is the issue of geoengineering. Some climate change scientists are optimistic about intentionally injecting sulphur aerosols into the stratosphere, reflecting sunlight into space thereby countering global warming. Most other people I have discussed this with have considered this procedure risky and I agree, though there is no harm in doing simulation studies and laboratory experiments.

MITIGATION OF THE CLIMATE CHANGE THREAT

Carbon dioxide is the major greenhouse gas and is emitted during production of power from fossil fuels. So, for mitigating the impact of

climate change, we must to the extent possible, minimize the production of carbon dioxide during power production. I have been saying for more than two decades that, to calculate the Human Development Index (HDI) for a country like India, you need only two parameters, viz., per capita electricity consumption and female literacy—not three that the UN uses, viz., per capita GDP, life expectancy at birth and adult literacy. India's per capita electricity consumption must go up by at least 6 to 8 times, before India becomes a "developed country" in the fullest sense of the term.

That is why mitigating technologies, in the context of the climate change threat, like nuclear and renewables (hydro, solar and wind), are so important for us. Furthermore, for the next two or three decades, most of our additional power-producing capacity will come from burning coal. The higher the temperature of steam, more the power you get from the same amount of coal. Therefore, for the same power, you emit less carbon dioxide and it becomes a relatively cleaner carbon technology. My office has encouraged a consortium of IGCAR, BHEL and NTPC to take up the design of an Advanced Ultra-Supercritical Thermal Plant, where steam temperatures will be in excess of 700 deg C. There is also research interest in carbon capture and storage, or converting the carbon-dioxide molecule into a useful non-greenhouse molecule.

Conclusion

Climate science is a complex field of research and we must attract excellent young brains in it. I am very happy that the MoES has recently started "a comprehensive and integrated training programme on the climate system, with emphasis on land-ocean-atmosphere-biosphere-cryosphere systems and their interaction with and quantitative and hands-on exposure to global models". The most important aspect of the programme, following the pattern of the BARC Training School, is assured job placement for successful candidates in MoES institutes. This is the only way to go in super-specialized fields. Talented young people today have many good career options.

Dr. R. Chidambaram

Dr. Rajagopala Chidambaram became the Director of the Bhabha Atomic Research Centre (BARC) in 1990. He was Chairman, Atomic Energy Commission, from 1993 to 2000. Since 2001, he has been the Principal Scientific Adviser to the Govt. of India.

Dr. Chidambaram is one of India's distinguished experimental physicists. Dr. Chidambaram played a leading role in the design and execution of the peaceful nuclear explosion experiment at Pokhran in 1974 and also led the DAE team which designed nuclear devices and carried out the Pokhran tests in May 1998 in cooperation with the DRDO. He has made important contributions to many aspects of our nuclear technology. He has D.Sc Degrees (h.c) from twenty universities from India and abroad. He has more than 200 research publications in refereed journals and all his research work has been in India.

He was Chairman of the Board of Governors of the IAEA during 1994-95. He is also a Member of the Prime Minister's Council on Climate Change and Chairman of the High-Level Committee for the National Knowledge Network. Dr. Chidambaram has won many awards including the Padma Vibhushan, the second highest civilian award in India in 1999.

More recently, his initiatives as Principal Scientific Adviser to the Government of India, including the setting up of the Core Advisory Group for R&D in Electronics Hardware (CAREL), the creation of RuTAGs (Rural Technology Action Groups), the establishment of SETS (Society for Electronic Transactions and Security) headquartered in Chennai, etc., are making significant impact. He has emphasized the need for "Coherent Synergy" (a phrase he has coined) in India's S&T efforts to help put India on a sustained fast-growth path. He has also focused on the importance of "Directed Basic Research" as an additionality (not a substitute) to self-directed basic research.

Innovation in Education and Education in Innovation

Dr. R.A. Mashelkar

There was a discussion on what is possibly the most powerful equation ever developed by scientists over the centuries. Someone said that it was the equation describing Newton's second law, giving the relationship between force (F), mass (m) and acceleration (a), namely, **F = ma**. Someone else said that it is Einstein's equation linking Energy (E) to mass (m) and the velocity of light (c), namely, **E = mc²**. Others came out with some other suggestions.

Then they asked me. I said none of the above. The most powerful equation is **E = F**. Here **E** is Education and **F** is Future! This means education is equal to the future. This equation is universal and eternal. If there is no education, there is no future. No security of the future for the individual, no security for the future of the nation.

A recent statement that was made by our Prime Minister Dr. Manmohan Singh endorsed the power of this equation **E = F.** When he was greeting the nation on the arrival of the new year 2012, he said "I was born into a family of modest means, in a village without a doctor or a teacher, no hospital, no school, no electricity. I had to walk miles every day to go to school, but I persevered and was fortunate to be able to secure a high school education, and then go on to higher education. It is this access to education that transformed my life and gave me new opportunities which others with my background could not dream of."

Education is deeply linked to the security of a nation as well as national development. And this has become obvious, as we have moved

from an agricultural economy to the manufacturing economy to (service based) knowledge economy to creative economy.

President Obama said in 2009 in Cairo that the currency for the 21st century will be education and innovation. I will go further and say that what we need most now is education in innovation and innovation in education. And India needs it the most.

These are very interesting times for the education system as a whole in India. First, the Indian system of education is undergoing sudden massive expansion. When did you last hear that thirty new central universities, twenty new Indian Institutes of Information Technology, five new IITs, six new IIMs, five new IISERs were being created within the space of just a couple of years?

Second, the role of the private sector in education is being redefined because of additional needs for massive resources that will be required.

Third, refers to liberalization of the education sector in India. India was so far being viewed as a third world country. It is being now viewed as potentially the third most powerful country. All this is because of what happened on that magical day, 24 July 1991, when our present Prime Minister in his role as the then Finance Minister, announced the new industrial policy that was truly an example of a disruptive public policy innovation. Although trade and industry was liberalized in 1991, the process of liberating India's education and the agricultural sector has not still been completed.

Connected with liberalization is the issue of globalization of education. As regards globalization of technology, it has manifested itself in India. Practically all the leading multinational companies have set up their R&D centres in India (almost 800 of them now employ about 200,000 Indian scientists, engineers and technologists). But what about globalization of Indian education? Indian companies are acquiring companies abroad. In fact, Ratan Tata, an Indian, is today the biggest employer of the British in Britain with the acquisition of Corus, Jaguar Land Rover, and so on. What about Indian universities setting up compuses abroad? What about Indian universities hiring foreign academics as faculty?

Fourth, the issue of inclusive growth also translates itself into an all round inclusion of "have nots", where this section of the excluded society gets access to high quality education, that is "affordable and accessible". The justifiable quest for "inclusion" is also accompanied by the challenge of balancing "expansion, inclusion and excellence".

Fifth, for the teaming young Indians, the issue of "growth" translates into "job led growth". Therefore, education and skills that Indian education systems impact must lead to hundreds of millions of jobs. And the news is not good on this front. Reportedly, we are producing over three million first degree holders annually and less than 20 percent of these people are employable! The problem is that as these graduates neither have skill sets nor any disciplinary depth. Therefore they are ill-equipped for crafting a meaningful career. This is a colossal waste.

Innovation in education involves the creative use of the fascinating advances in technology to do away with the old style classroom teaching, which is going to become history.

Look at the dramatic changes that are happening around us due to advances in information and communication technology. Digitisation, virtualisation, mobilization and personalization are the four new megatrends. All these will lead to game changing cocreative, self-organising, self correcting, borderless, globally distributed, asynchronous, dynamic and open systems. Data, voice and video will be delivered with 3G and with the imminent arrival of 4G in India. The processes of self learning, interactive learning and life long learning will undergo a sea change with all these paradigm shifts.

Discovery Education is leading the way in the digital learning movement by producing video-based content that reaches more than half of all US schools, including one million teachers and 35 million students. The company is developing digital math and science curricula for public school students in Chicago and Detroit.

Togetherville is creating a social network built on top of Facebook for kids, families, and teachers that allows them to express their thoughts on educational issues. Roughly 90,000 US schools are already included in its database.

Open Study is building a social learning network where students can ask questions, offer help, and connect with other students studying similar topics. Its mission is to make the world one large study group, regardless of students' locations or backgrounds.

Irynsoft is providing the first basic mobile platform that allows users to take a course on their iPhones. It has already been adopted by MIT Open Course Ware.

Khan Academy is building a collection of more than 1,800 short, simple video lectures and chalkboard demos that cover everything from

math to physics to economics. The brain behind these web tutorials: Sal Khan, a 33-year-old Harvard MBA who developed the project out of his closet. Now, with Gates Foundation funding, he's taking his adaptive learning system to classrooms.

In India's journey from a third world country to the third most powerful country in the world, recognizing and leveraging these signposts of paradigm shifts alone will create the India of our dreams.

Innovation means doing things differently that can make a difference. It means innovative use of resources. I will just give you one example. Four hundred thousand engineering students spend six months of the final year by working on technology projects. This means over two million human months of our "*yuvashakti*" is being spent on solving real life problems. For the first time, we have access to the magnificent outcome of this great endeavour.

The inspirational leadership of Prof. Anil Gupta of the National Innovation Foundation was responsible for creating *Techpedia.in*. This now has over 100,000 technology projects. In just six months, the minds of over three lakh students have been mapped. This impossible looking feat has been achieved due to the extraordinary energy of Hiranmay Mahanta. You will be proud to hear that he is a product of NIT. He and his team of volunteers of the Sardar Vallabhbhai National Institute of Technology (SVNIT), Surat have created this magic. The challenge is to take this grand initiative forward. What do we need to do?

First, it is not the power of ideas alone, but the power of execution that is going to matter. A student has designed a strategy for active control of space launch vehicles in the presence of fuel slosh. Should not the Indian Space Research Organisation (ISRO) be looking at this solution? A few girl students have together designed a Black Box for vehicles just like we have in airplanes. Should not our auto manufacturers be looking at it? Such knowledge and information sharing networks between creative students and the ultimate users must be created.

Second, we have to concentrate this unique "*yuvashakti*" on Indian problems that "need" to be solved rather than those that "can" be solved. We should ignite these young minds with India's grand challenges. How do we partner with the engineering colleges to make youth focus on these grand challenges?

Third, we must link 100,000 MSME and the informal sector enterprises, who are in search of solutions for their problems with these databases.

Fourth, our national laboratory systems as well as agencies such as the Department of Science & Technology (DST) and Department of Scientific & Industrial Research (DSIR), must put their weight behind these ideas.

Fifth, there are hundreds of eminent Fellows of our national academies of science and engineering. They must all join in as mentors by registering on *techpedia.in*. Their mentoring in their individual domains of expertise will raise the quality and be truly motivating for these young innovators.

The Prime Minister of India has declared the second decade of the twenty first century, i.e. the years 2011-2020, as the Indian Decade of Innovation. And in this Indian Decade of Innovation, let us take a pledge:

- We will make the transition from being a weak and hesitant private sector partner to a strong practitioner of privately managed non-profit institutions of higher education.
- We will do away from being a tentative destination for occasional foreign students to be the preferred global destination for foreign students.
- We will change the image of being a suspicious viewer of foreign institutions to becoming an aggressive partner and competitor of foreign institutions.
- We will move from being a minor follower and a player in R&D and innovation to a global leader and a giant in R&D and innovation.
- We will be an aggressive disruptive innovator rather than an uninspired incremental innovator.
- We will be a confident and competitive intellectual property promoter rather than being protective and restrictive intellectual property practitioner.
- We will move from occasional world-class university builder to the builder of a hundred world-class universities.
- Instead of being copier of best practices in education and research, we will become the creator of next practices in education and research.

And it is these paradigm shifts in our attitudes and in our actions that will make the dream of a secure and developed India come true, sooner rather than later.

Dr. R.A. Mashelkar, FRS

Dr. R.A. Mashelkar, National Research Professor, is also the President of the Global Research Alliance, a network of publicly funded R&D institutes from Asia-Pacific, Africa, Europe and the USA with over 60,000 scientists.

Dr. Mashelkar was the Director General of the Council of Scientific and Industrial Research (CSIR), the world's largest chain of industrial R&D laboratories for over eleven years. He was also the President of the Indian National Science Academy.

In post-liberalized India, Dr. Mashelkar has played a crucial role in shaping India's S&T policies. He has been a member of the Scientific Advisory Council to the Prime Minister set up by successive governments for the past three decades.

Dr. Mashelkar is only the third Indian engineer to have been elected (1998) as Fellow of Royal Society (FRS), London in the twentieth century. He was elected Foreign Associate of the US National Academy of Science in 2005, Associate Foreign Member, American Academy of Arts & Sciences (2011); Foreign Fellow of the US National Academy of Engineering (2003); Fellow of Royal Academy of Engineering, U.K. (1996) and Foreign Fellow of Australian Technological Science and Engineering Academy (2008).

Dr. Mashelkar is on the Board of Directors of several reputed companies such as Reliance Industries Ltd., Tata Motors Ltd., Hindustan Unilever Ltd., Thermax Ltd., Piramal Enterprises Ltd., KPIT Cummins Infosystems Ltd., etc. He chairs the Boards of Reliance GeneMedix and Vyome Biosciences.

In 1998, Dr. Mashelkar won the JRD Tata Corporate Leadership Award, the only scientist to win it so far. On 16 November 2005, he received the Business Week (USA) award of "Stars of Asia" at the hands of George Bush (Sr.), the former President of USA. He was the first Asian Scientist to receive it.

Deeply connected with the innovation movement in India, Dr. Mashelkar is currently the Chairman of India's National Innovation Foundation, Reliance Innovation Council, Thermax Innovation Council, KPIT Cummins Innovation Council and Marico Innovation Foundation.

Thirty universities have honoured him with honorary doctorates, which include the Universities of London, Salford, Pretoria, Wisconsin and Delhi.

The President of India honoured Dr. Mashelkar with Padmashri (1991) and with Padmabhushan (2000).

Historical Dimensions to Defence Technology Development
Need for a Transformational Strategy

Dr. V.K. Saraswat

HISTORICAL BACKGROUND

It is a bitter fact that India missed the Industrial Revolution of the 19th Century and remained largely an agrarian economy till independence. As such, at the time of independence, our country had practically no industrial base. The situation in the defence technology sector was characterized by the presence of a few ordnance factories producing goods based on British technology and a few inspection centres assisting them for limited indigenization and product support for the armed forces.

Our first Prime Minister Pt Jawaharal Nehru, a visionary realized this situation on the technology front and said post-independence that:

> "Science alone can solve the problems of hunger, poverty and security."

Pt. Nehru combined his vision of science and technology with the concept of planned development to achieve a socialistic pattern of society. As part of this vision, Independent India embarked on setting up large Public Sector Undertakings (PSUs) in the areas of steel manufacturing, thermal power plants, mineral exploration, oil exploration, defence equipment manufacturing, drugs manufacturing, aviation, shipping, mining and other strategic technology areas in collaboration with friendly countries like Russia. In parallel, the private sector also initiated technology collaboration with foreign companies in different areas like textiles, consumer goods, automobiles, drugs and pharmaceuticals, plants

and equipment for chemical industries, cement plants, mining equipment, etc. The country was in a hurry to catch up with the developed world technologically to meet ever growing domestic requirements. There was no investment in the defence technology sector by private industries. The Ministry of Defence set up new ordnance factories and defence PSU's to meet the requirements of the armed forces in collaboration, as part of the equipment acquisition programme.

By and large all defence PSU's including HAL, BDL, BEL, BEML and the ordnance factories acquired technology know-how as part of licensed production. This situation was not only in the defence sector but also prevailed in energy, aviation, oil and chemicals, mining, etc., Our planners had assumed that these PSU's will turn into centres of technology excellence and will start innovating new products and technologies. This did not happen, because we were completely dependent on collaboration, for strategic technology inputs like materials, forgings, castings, special manufacturing processes and even critical machines and test equipment. No design know-why was ever given by any collaborator. While this developed the capability to manufacture defence equipment like guns, ships, aircraft, missiles, radars, etc., but did not give us the capability of designing and developing and innovating any new equipment indigenously.

As a result, both in the public and private sectors, we continued to look for foreign technology for every new product. While India today has vast manufacturing infrastructure for specific products, it lacks a basic technology base in contemporary materials, sensors, electronics, composites, machine tools, functional materials, avionics, propulsion systems, micro electronics, micro machining, automated manufacturing, software development and now the emerging areas of nano technology, photonics and digital manufacturing. The list is fairly large and ever increasing. *Certainly, we have acquired few benefits* by licensed production, but remained a technology follower.

In parallel, when the PSU/OF built up was on, the vision of Pt Nehru also gave birth to three strategic departments, viz., Atomic Energy, Space and Defence R&D under the leadership of Homi Bhabha, Vikram Sarabhai and Dr. Kothari respectively. CSIR was also set up under the leadership of Dr. S.S. Bhatnagar. With a humble beginning of 10 labs in 1958, DRDO started working on the development of various technologies for our armed forces, and today have grown into an organization with over 50 labs engaged in a wide variety of technology disciplines ranging from

aeronautics and naval systems to materials and life sciences, as also from soldier selection and protection to sophisticated ballistic missile defence, strategic missiles and armaments.

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DEFENCE RESEARCH AND DEVELOPMENT

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The first two decades, i.e. the 60s and 70s saw the development of defence technologies for various sub-systems and components. Focus shifted to the development of major systems/platforms like missiles, aircrafts tanks, electronic warfare systems and sonars in the 80s and 90s in mission mode with concurrent engineering and concurrency of development and production. These programmes helped in the development of critical technologies for solid propulsion, liquid propulsion, inertial navigation, electro-hydraulic control systems, embedded on-board computers, strategic materials like maraging steel, titanium, carbon composites, Ni-based super alloys, magnesium alloys, IR seekers, command guidance system, ramjet propulsion, phased array radars, ceramic/composite radomes, armoured materials, high energy propellants, explosives, conventional warheads, mobile launchers, under-water launch capabilities, EW systems, sonars, etc.

In the last 50 years of its existence, DRDO has developed the following major systems.

Missiles

PRITHVI, DHANUSH, AKASH, AGNI-1, AGNI-2, AGNI-3, AGNI-4, AGNI-5, B05, PRAHAR, BMD Systems.

Aeronautics

The development of the Light Combat Aircraft for the Airforce and Navy is in an advanced stage of induction and production at HAL. Development and production of unmanned aerial vehicles, viz., Nishant, Lakshya, Rustom-I, Mini UAVs have been carried out.

Armoured Vehicles and Engineering Equipment

Development and production of the MBT Arjun is a major technology breakthrough leading now to the development of MBT Mk-II and later FMBT. It may be noted that MBT Arjun is superior to the T-90, a Russian tank presently with the Indian Army, in many aspects. Bridging equipment, viz., sarvatra and dossers, anti-mining equipment have been developed and delivered.

The list is fairly long which includes NBC equipment, naval systems like torpedoes, life support systems, warheads, granades, armoured materials, special steels for ships, carbon composites for missiles, parachutes, aerostats, laser dazzlers, chemical detection sensors, NBC protection gear, camouflage nets, etc.

Radars

Indra, Rajendra, Weapon Locating Radars, 3D-Surveillance Radars, Rohini, Revathi, Long Range Tracking Radar (LRTR), Multi-Functional Radar (MFCR), Battlefield Surveillance Radar (BFSR) have been developed and are being produced by BEL.

In this area, DRDO turned a corner technologically by developing Electronically Scanning Active Phased Array Radars. The degree of self-sufficiency is evident both in DRDO and BEL – a close partner in the development and production of radars. Major programmes are underway to develop missile guidance radars for LRSAM/MRSAM and multimode radars for LCA, and maritime patrol airborne radar.

Electronic Warfare

Major programmes like Samyukta, Sangraha, Divyadrishti have enabled technology and product development in all segments of EW mainly commint, elint, ESM. Covering ECM and ECCM features airborne and shipborne systems have been developed by DRDO and produced by BEL to meet significant requirements of the Airforce and Navy. Migration increasingly to the digital domain and better accuracy of direction finding and radar fingerprinting is in progress.

Sonars

Major technologies and products developed and delivered in this area are hull mounted sonars, towed array sonars, dunking sonars, anti-torpedo systems.

The list is quite impressive, particularly keeping in mind that the country did not possess any industrial base.

As part of the programme's concurrency approach, the production infrastructure at BDL, BEL, HAL, BEML and many ordnance factories was augmented. In fact, in collaboration with ISRO, the DRDO setup an aerospace division at HAL Bengaluru for production of PRITHVI airframe and engine and PSLV. The production technology was upgraded to include CNC machines, automatic welding, magnesium casting,

vaccum brazing, HIP, CIP, flow forming, investment casting and powder metallurgy products in special heavy alloys like Tungsten.

Special emphasis was placed on involving private industries in the development and production with a policy decision that all development partners would have a major share of production orders on a preferential basis with cost control exercised and monitored by a government appointed Expert Committee. This resulted in the growth of more than 40-50 industries across the country by eventually developing into B2P (Built to Print)/B2D (Built to Design) partners for future defence programmes (refer Figure 1).
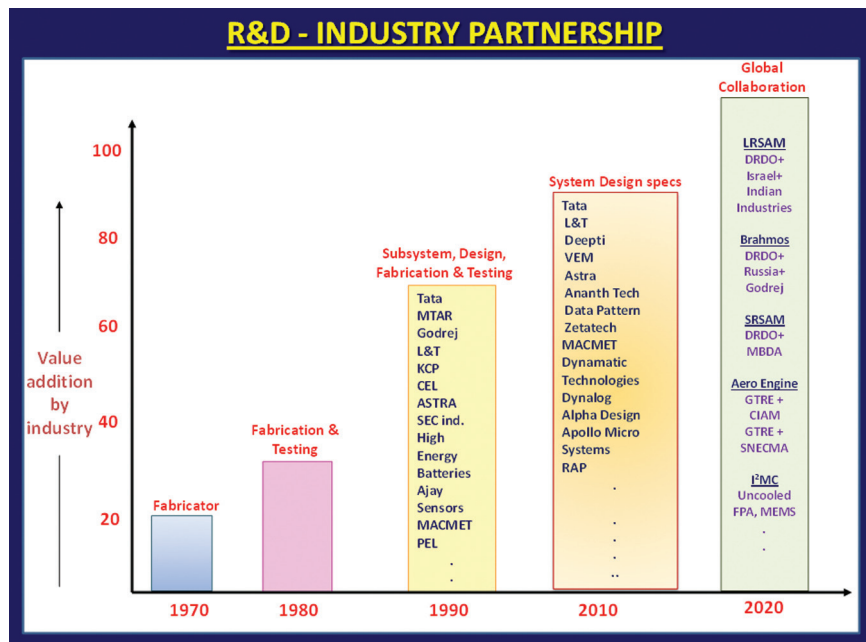
Figure 1

The biggest gain of these programmes has been the development of the country's capability to combat Missile Technology Control Regimes (MTCR) imposed by the developed countries in the late 80s and reinforced in 1998 after the second nuclear test. With the participation of Indian academia, industries and public and private and national laboratories including CSIR labs, the country could develop and produce servo valves, actuators, dry tuned gyros, accelerometers, magnesium castings including alloys, precision sensors and military certified electronics systems. In fact,

while the impact of MTCR was felt in the form of delays in programmes, but the ultimate gain was in terms of self-reliance in some of the critical technologies.

The total value of DRDO products under production at Defence PSUs, ordnance factories in the last 5-7 years is more than ₹ 1,65,000 crores – a significant value.

What is the Problem then?

Despite these types of gains in the last 50 years and bringing the Self-Reliance Index to more than 45 percent, the fact remains that India is importing most of the equipment, weapons and critical technologies to meet its defence needs. What is the reason? Many experts have tried to analyse the problem and generally blamed the DRDO for taking too much time in development and also working in isolation of the armed forces.

To understand the issue in a correct perspective, the historical dimension discussed earlier is the key factor for our slow progress as a nation. Developing missiles of different types, light combat aircraft, MBT Arjun, EW system, sonars, Kaveri engine, aerostat, radars, torpedoes, special materials, NBC equipment, engineering Equipment, etc., in 25 years with a limited infrastructure industrial base, little support from academia, no development culture in industry, limited funding and of course varying requirements of users and the kind of disconnect between DRDO and production agencies, technology control regimes and competition with multinational companies supplying weapons/ equipment to armed forces compares well with the development time of 17-20 years taken by the US in developing joint strike aircraft, BMD system and many other equipments, inspite of having a well developed industrial and R&D base in the country and the definitive policy of the US Govt to not import weapons/equipment for defence. However, there are weaknesses in the system as described in the following section:

Valley of Death Syndrome

Many of our programmes have suffered from the Valley of Death Syndrome where basic research has not lead to applied research/innovation and proto-type development has not reached the market due to:

    (i) Disconnect between universities/academic institutions and national labs/industries

(ii) Disconnect between national labs developing sub-systems/systems/platforms and the production agencies/industries

(iii) Time and financial resources not factored in the project/programme plans

This problem of transition has been identified by the US Congressman Ehler as the Valley of Death. The main reason in the Indian context is the lack of productionisation capability in industry because it has been trained for years for licensed production. Concepts like design for production, value engineering, digital manufacturing and system engineering are not followed judiciously by designers, and industries have no experience of introducing them resulting in poor quality and not very cost effective products produced at very low prices of production thereby not meeting the requirements of the market. In our transformation strategy we need to factor in these aspects.

Design Capability – An Achilles Heal

It has been acknowledged by all that our country does not possess "DESIGN" capabilities in practically all spheres, mainly because of the environment of licensed production in the private and public industries. In addition, the university/academic curriculum also has not paid enough attention on building design know-how and know-why among our engineers. This deficiency is evident during development of practically all platforms, viz., ships, submarines, aircraft, armoured vehicles and many armament and electronic systems, auxiliary systems like propulsion systems, machine tools, test equipment, measurement systems, etc.

In addition, there are basic technology problems in the area of materials, sensors, electronic components, functional materials, etc., acting as major stumbling blocks in the development of indigenous systems.

TRANSFORMATION STRATEGY

Special Features of Defence Systems

In order to work out a strategy for future technology development, it is essential to understand the peculiarities of defence systems. Aerospace and defence systems are characterized by:

- Complex designs and long project cycles
- Large R&D investments
- Large investments in manufacturing and test equipment

- Special materials of unique specifications
- Requires advanced manufacturing techniques
- Physical sizes ranging from micro meters to meters
- Small batch size for production – in many cases like ships, etc., one off
- Quick technology obsolescence
- Diverse multi-disciplinary technologies
- Intensive technical, quality and safety requirements
- Stringent regulatory environment
- Poor supply chain management
- Poor linkage of R&D and production especially in the Indian context
- High emphasis on long product life requiring very efficient product support systems.

Emerging Eco-System

Over the last twenty years there has been a significant change in the echo-system of our country to take on ambitious large size highly technology intensive programmes. The emerging echo system is characterized by:

- India has gained extensively through various projects
- Core technology base has been established within the country
- Enhanced industrial capability
- Increased role of industry
- Increased awareness and exposure to modern technologies of new scientists
- Vibrant industrial growth
- Changed perspective of government in terms of priority
- Buy and make Indian plus presence of off-set clause as opportunity
- Technology denial regimes becoming irrelevant
- New strategic relationships are emerging globally
- Focus on greater accountability
- Higher expectation and confidence of users
- Globalisation and global markets
- Indigeneous R&D developing high performance, cost-effective products with efficient product life cycle support and technology obsolescence management
- Indian industry getting not only know-how, but know-why due to indigenous R&D and also change in philosophies from licensed production to joint ventures like Brahmos, LRSAM, FGFA, etc.

These characteristics also need to be factored in while evolving strategies.

Changing Face of Indian Aerospace and Defence

India is present in all segments of the aerospace and defence value chain which is:

- Research and development
- Engineering design
- Manufacturing
- Assembly
- MRO design
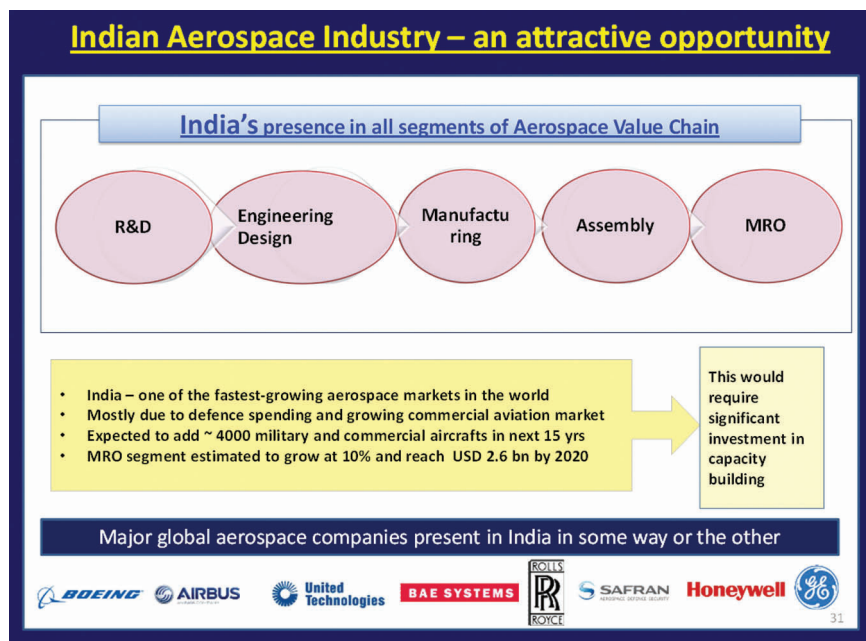
Figure 2

India is one of the fastest growing aerospace markets in the world mostly due to high defence spending and a growing aviation market. It is expected that approximately 4,000 military and civil aircraft will be inducted in the next 15 years. This would require significant investments in capacity building. We also have presence of global aerospace and defence companies, viz., Boeing, Airbus, BAE Systems, Safran, Honeywell, GE, Raytheon, Rolls Royce, etc.

India is expected to be the third largest aerospace market after U.S. and China by 2020

- 10th biggest spender in defense. FY 13 budget – USD 35bn
- Expected to spend USD 100 bn in next decade
- Military expected to add 1000 rotary & 1200 fixed wing aircrafts

Defense

Development Programs:
- Aeronautics, Armaments, Combat vehicles
- Electronics, Missiles, Materials
- Medium Multi Role Combat Aircraft (MMRCA)
- Fifth Generation Fighter Aircraft (FGFA)
- Multirole Transport Aircraft (MTA)
- Medium Lift Helicopters (MLH)
- Light Utility Helicopters (LUH)
- Hypersonic vehicles

- India projected as 5th largest buyer of passenger aircrafts
- Commercial aircraft projected to grow at 6% CAGR
- Business jets to grow at 11% CAGR
- Modernization underway:
  - Airports
  - Communications
  - Radars
- Facilities for MRO

Indian Aerospace

Civil

Space

Development Programs:
- Satellite Launch Vehicles
- PSLV, GSLV
- Satellites
- INSAT, IRS

Intensive technology and safety requirements mandate significant investments in R&D and quality control

Figure 3

India has major development and production programmes in aeronautics, armaments, combat vehicles, electronics, missiles, materials and some of the sanctioned programmes are medium multi-role combat aircraft MMRCA, fifth generation fighter aircraft FGFA, multi-role transport aircraft MT, medium lift helicopters, light utility helicopters, LCA, LCA (Navy), 155 × 52 calibre guns, BMD systems, airborne EW systems, radars, FMBT, long span bridging equipment, satellite based EW and communication, strategic submarines and other naval platforms, NBC equipment, LRSAM, MRSAM, ATM, etc.

With these programmes, India is expected to be the third largest Aerospace and Defence Market after US and China by 2020/2025.

Proposed Strategy

In the light of the changing face of the Indian aerospace and defence segment, alongwith the unique technological and market features of defence equipment, a multi-layered strategy is proposed to meet immediate requirements of the user/market and to build a strong technology base.

Procure, import and acquire weapons and equipment required by our services for immediate use (within the next seven years) with certain modified procurement policies and provisions of off-sets. The off-set obligations to be identified from core technology areas. If there is a requirement to manufacture the item in India, then the same to be organized/contracted with adequate provisions of production of more than 50 per cent of Class "A" items and total system integration to be carried out by Indian industry. It should be ensured that the country should have the IP to produce the required numbers without any reference to OEM and carryout modifications to cater for technology obsolescence and user driven operational requirements. R&D institutions of the country should be involved in this process to ensure absorption of know-how and know-why alongwith the identified production agencies presenting a unified approach to the foreign collaborator. A joint venture arrangement should be preferred over lopsided licensed production arrangements. The off-set clause should be leveraged upfront to get the required technologies, production and testing infrastructure and even training in high end design and manufacturing processes.

Today, it is a global market with fluctuating world economies. Also Asia is the only geographical segment with high growth of the defence market. Since domestic consumption of defence equipment in Europe is limited and the US/Russia largely meet their requirements from domestic R&D and production, large numbers of established defence and aerospace companies are facing a severe market crunch leading to near closure of these industries. It's an opportunity for our country. The way our industry giants like TATA's/Mittal's/Mahindra's, etc., have acquired companies in coal, energy, steel and oil sector the same approach should be encouraged in defence and aerospace. Our country should mount a strong programme in collaboration with Indian industry giants, or otherwise, to acquire lock stock and barrel (design, development, manufacturing and testing facilities including captive trained manpower) from these firms and accelerate the process of bridging the ever increasing technology gap. We need to evolve a policy frame work in this regard to incentivize and facilitate the acquisition process.

This is the requirement demanding all out efforts to develop indigenous technologies and produce state-of-art weapon systems and equipment leveraging the gains of Level 1 and 2 and working with all stake holders in the country. Towards this one has to –

> "*Establish, build, evolve, inter-connect and integrate multiple institutions as national base for development of advanced technologies. It will be a dynamic and vibrant process spread across the entire nation encompassing academic institutions, universities, R&D organisations, national laboratories, industries both in the public and private sectors and govt departments, defence services spin-off and dual use commodity markets.*"

This layer needs detailing. The implementation strategy would involve the following steps:

- Build and develop requisite infrastructure to support and sustain new technology development processes, viz., setting up foundries for μ-electronics, photonics, FPA, high power microwave systems, test and evaluation infrastructure for aero-engines and its subsystems, tank engines, propulsion for ships and sub-marines, advanced manufacturing centres for lean, mean and green manufacturing, composite and ceramic manufacturing, etc.
- Develop new policy framework to link and connect multiple agencies in a seamless manner and cater for failures in the development process.
- Build systems/organizations to develop and produce products with lower time cycles utilizing the funds effectively.

IMPLEMENTATION STRATEGY

Eco-System

The first step for implementation would be to create an eco-system to facilitate accelerated growth of technologies in a synergestic manner. The eco-system should have the following features:

- Favourable and fair rules of the game establisher
- Funds and incentives to industries for R&D strategies
- A climate that rewards risk taking and tolerates failures
- An open business environment
- A decent quality of life
- A specialist business infrastructure that understands and is supportive of entrepreneurship
- Universities and R&D institutions that are incentivized and want to interact systematically with business.

**Global Trends in Advanced Manufacturing of
Aerospace and Defence Systems**

Over the years, the framework for development and manufacturing has undergone drastic changes due to growth in technologies, particularly the convergence of bio-nano and IT technologies and ICT forming the binding layer for efficient design to the manufacturing cycle including future requirements of sustainability and sustainable engineering. Obviously this change will have to be factored in our strategy for future development and manufacturing (refer Figure 4).
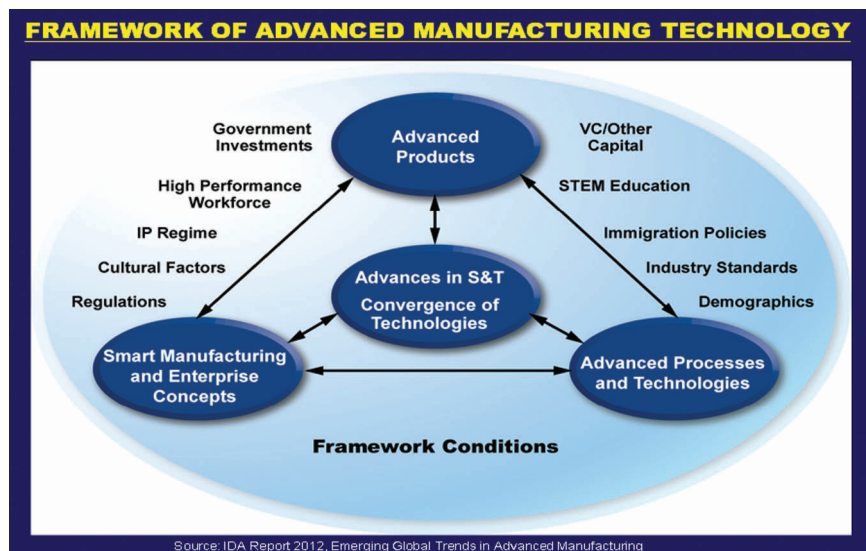
Figure 4

As discussed earlier, advanced products are characterized by complex technologies, use of new materials and sophisticated and innovative designs. Advanced manufacturing consists of know-how and know-why of production with focus on advanced processes and technologies.

Smart manufacturing enterprise goes beyond the factory floor. Paradigms of "Manufacturing as Eco-System" have emerged. Smart enterprise create and use data and information throughout the product life cycle. It creates flexible manufacturing processes to cater to the changes in demand at low cost without damage to the environment. Products are designed to facilitate efficient production and recyclability.

All this is done with a strong R&D base in physics, chemistry, materials science and biology and their convergence associated with excellent

capability in modeling and prediction with state-of-art computing power.

Upgradation of Production/Manufacturing Technologies in Indian Industry (Public/Private)

In order to compete globally in terms of quality and cost, it is essential to upgrade the manufacturing technologies of our industries. If we take a dispassionate view of our manufacturing base, it will be seen that we have not kept pace in this field also due to the licensed production culture prevailing in industry by bringing in obsolete technology, machines and manufacturing processes. In fact, this fact surfaced quite clearly during the production of the LCA at HAL. Even in the area of machine tools the technology has to be imported because as of today after the closure of the HMT machine tools factory, other than CMTI, there is no institution engaged in development of new machines for future production frame work in line with global trends. India needs to induct the following manufacturing technologies/machines in the next decade at a very fast pace to meet the requirements of aerospace and defence programmes at hand.

List of Machines

- Water jet machining
- Hexapod machining
- Multi tasking machines
- Role extrusion for missile cases
- Single crystal based super alloys for gas turbines engines (BLISK)
- Integral fuselage design and manufacture (welded structures) – extrusions, laser beam welding, friction stir welding
- Near net shape manufacturing
- Advanced aluminum alloys and fabrication technologies for space transportation systems – near net extrusion
- Roll forging ⎫ cryogenic tanks
- Shear forging ⎬ for adaptor rings
- Spin forming ⎪ tank domes
- Friction stir welding ⎭ internally stiffened extrusions
- High voltage electron beam welding
  – Reactive material Ti-6Al-4V alloy
  – Multiple tier welding, multi-thickness welding
- Friction stir welding

- Laser consolidation processing
- Laser engineered net shaping
- Vacuum plasma sprays
- Photo chemical machining

Future Technology Roadmap

With the emerging threat perceptions of conventional and asymmetric warfare and galloping technology growth influencing the Revolution in Military Affairs (RMA) and changing doctrines, it is essential that India should look at its plans and practices for development of future technologies, weapon systems and equipment.

India has to adopt a two pronged strategy as there are two dimensions to Science & Technology – one basic science and scientific research and the other is futuristic technology development. We need to have continued growth in both these fields. The broad areas of focus should be:

- Unmanned technologies for air, land and water – including autonomous navigation, intelligent decision making capability.
- Stealth and anti-stealth technologies including multi-spectral materials and multi-static radars to combat stealth.
- Under-water communication for naval application, blue green laser for communication, VLF, ELF, software defined radios, cognitive radios with security layers.
- Hypersonic technologies including materials, aerodynamics and propulsion.
- New computing technologies, viz., quantum computing, photonic and si-molecular computing which is likely to change the shape of computing in future.
- Special functional materials like gallium nitride, indium phospide, silicon carbide, germanium vanadium oxide, etc.
- High power microwave devices.
- Advance mathematics, statistics and computing technologies for cyber security, viz., cryptography and cryptanalysis, automatic target recognition, decision support systems, artificial intelligence speech recognition and multi-spectral image processing.
- Network centric operation technologies and adaptive networks.
- Special Materials and manufacturing processes like single crystal blades with super alloys/inter-metallic compounds, cooled blades, functionally graded composites, carbon-metal composites,

carbon-carbon carbon-Si composites for rocket engines, gas turbine engines and scramjet engines.

- Directed energy weapon technologies with focus on high power laers, high power microwaves with attendant technologies which calls for high tech electronics including adaptive optics and beam steering, etc.
- *Space based systems:* Space security is going to be the main concern in the future. Hence, it is essential to build competence in critical technologies, viz., reusable entry vehicle technology, space based ELINT, satellite based EW technologies, space denial technologies, low cost satellite launch systems, anti-satellite systems, etc.
- *Cyber security:* Technology for cyber forensic network hardware with secured layers, robust and trusted computing platforms, communication elements like routers, switches, critical criteria testing systems, crypt analysis tools, next generation encryption algorithms development, malware detection and mitigation.

This would require a technology development strategy with active
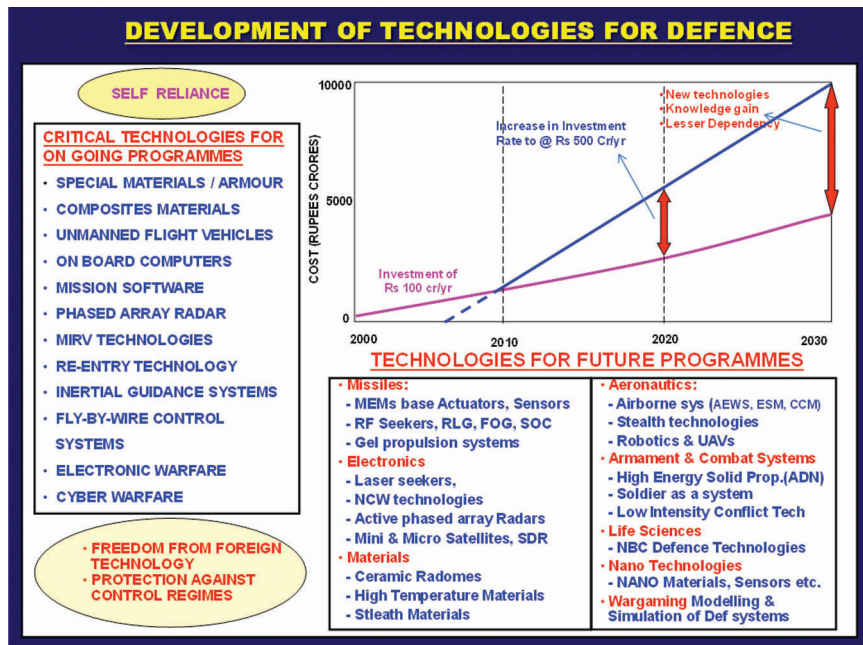
Figure 5

participation of academic institutions, industries, national laboratories and enhanced funding by government for setting up critical infrastructure for development. Investments to the tune of ₹ 500 cr/year would be needed in a focused manner for technology development. One time investments in setting up foundries for nano technology, photonics and next generation of micro-electronics, focal plume arrays, quantum well detectors, etc., It may be noted that without adequate investments and synergy among all stake holders, developing these technologies would remain wishful thinking and the technology gap will continue to increase (refer Figure 5).

All technology development programmes should bring the technology to a maturity level of TRL 3-4 so that product development can take off without any hiccups. This would require an effective mentoring and review mechanism at different layers of development, to ensure directed basic research and development without losing focus and avoiding operation in silos which have been a major negative factor in the past.

Research and Development as a Centre for Enhancing Industry Base

As brought out in earlier paragraphs advancement of indigenous technologies in missiles, radars, EW systems, UAVs, electronics, space, strategic systems and engineering equipment and associate growth of the industry base in both the private and public sectors have taken place due to directed and focused mission mode programmes taken up by our country. It is strongly felt that R&D should continue to take leadership in this area and incorporate the following features for higher rates of progress and improved R&D culture and investments by industry.

(i) Projects and programmes should involve industry during technology and product development for
   – Built to Print (B2P)
   – Built to Development (B2D)
   – Built to Requirement (B2R)
   – System Integration
   Choices in this respect have to be based on capability and capacity of industry. Efforts should be made to continuously upgrade industry partners from component manufacturers to system integrators through strong hand holding during the process of development. The relationship should transform from vendor to project partner

wherein success and failures are jointly shared and accounted for. This would require transformed contracting procedures with empowered committees/teams for review and mentoring the process of shared development and also maintaining the required level of accountability.

(ii) R&D should plan strong technology transfers in concurrent mode ensuring that know-how and know-why are transferred and absorbed by production partners. ICT should be extensively used alongwith modern tools for managing design, development, production and product support using ERP, PLM, etc.

(iii) R&D should earmark certain funds for investing in production centres for upgrading the production processes and support productionisation including risk management and redundancies due to concurrency of development and production.

(iv) R&D should be allowed to invest in production infrastructure in private industries also. It is essential that a policy and investment mode, taking into account transparency, accountability and continued support by industry throughout the life cycle of the product and maintaining the quality of the product at mutually and scientifically arrived costs should be evolved

(v) Defence and aerospace systems require extremely complex and costly test and certification infrastructure. Loading this investment on industry partners would not be a cost effective solution. To overcome this problem, a cluster of industries should float a holding company with share holding of each partner and this holding company should set up common facilities for usage by all, on payment basis. Alternatively, facilities available in R&D centres, defence public sector units/OFs be made available to all industry partners.

(vi) For long term association, it is proposed that R&D and industry should set up joint ventures to promote technology development, product development and production. JV partners to be chosen based on technology capability, financial strength, long term aims, objectives and business plans of the industry partners. Issues of IP and other legal aspects should be addressed by professionals on a mutually agreed basis, with the sole aim of enhancing the technology strength of the nation for global competition and growth of the economy.

Synergy between Innovation and Design

In order to overcome the problem of design capability, we have to follow the 21st century, innovation paradigm enunciated by MIT, US.

This would require universities/academic institutions to be research intensive, utilizing technology and design centric pedagogy in their educational approach.

Since, the paradigm shift in the university scenario is a long term solution, it is proposed that the country should establish national design houses in the areas of:

- Aeronautics including general systems of aircraft (manned/ unmanned)
- Propulsion (rockets, gas turbines, ramjet/scramjet, PDE, air-independent propulsion, IC engines for automobiles, electric propulsion, etc.)
- Advanced materials and composites
- Long range radars, avionics and control elements

Also to promote the growth of the next generation of manufacturing processes linked with the design of future generation of systems, we need to establish national centres of excellence in the following disciplines:

- Advanced manufacturing research centre
- National composite centre
- Nano-technology centre with emphasis on convergence of nano-bio-ICT – photonics

The vision of these centres should be to develop next generation technologies and automated machine tools for digital manufacturing and sustainable engineering. These centres should feed industry, small and medium, with the design of new machines and manufacturing processes.

Constitution of DARPA Type Institute in INDIA

Acquisition of advanced technologies which are revolutionary in nature, with high potential to give strategic advantage and with high risk in their development may not be taken up under normal methods of development. It is necessary to create an organization *with special powers* to undertake development of such breakthrough technologies by engagement and promotion of multiple sources. DARPA like organization will conceptualize such technologies and leverage the available capabilities in the country, or create the same through innovative approaches for their full scale development. This approach will accelerate the process of bridging the technology gap.

Management of Defence and Aerospace Equipment Development Programmes

Experience has shown that many of our programmes do not yield good results due to poor planning and execution. While it is an extremely complex topic involving many facets of programme management, a few important steps are proposed for incorporation in the programme planning process. All programmes to have:

- Integrated design and manufacturing
- System engineering approach
- Ultra low cost tooling, reconfigurable and adaptive
- Focus on processing of advanced materials (ceramics/composites)
- Through life digital engineering
    - Design for X (manufacture sustainability cost and reliability)
    - Supply chain planning and execution
    - Strong simulation and modeling
    - Metrology
    - Product life cycle evaluation
    - Computer aided manufacturing

Defence Production Policy (DPP)

Off-Set Policies

Government policies in awarding weapon system acquisition contracts go with offset policies. As Indian industry starts working in globally competing markets, suitable policies may be formulated to get technology based offsets rather than on generic fabrication based offsets. This way there is the possibility of acquiring "high end" technologies through the offset policy. In some cases, policies should be modified to accept vendors at L2 or L3 costs, if the vendors are willing to deliver advanced technologies along with products. Technology experts should be involved in a big-way in finalizing the off-sets.

Investments by Industry in R&D and PPP Working

Post 1991 liberalization policies, Indian industry is in direct contact with global markets and competitive conditions. Industry is expected to compete to survive. This requirement can be met only through in-house R&D, innovating advancements of technologies, new products, new processes and new ways of formulating complex systems. Industries

should make investments in R&D to progress technology-wise and product-wise developments in order to compete and supply advanced systems to defence. Indian industry is capable of evolving R&D processes and the government can provide the necessary incentives for the same through tax concessions, etc.

Government to formulate policy guidelines for –

(a) Classification of industry based on technology or discipline
(b) Formation of PPPs for performance to deliver systems

Models for PPP

It is proposed that the following approaches may be tried out:

- Royalty model (outright sell off of mature technologies)
- Total risk-revenue partnership sharing model (partnership from the stage of conceptualization)
- Partial risk-revenue sharing partnership model (partnership from certain level of maturity)

Government Owned Corporate Operated (GOCO) Model

As discussed in earlier paragraphs, defence equipment is low volume – high tech and high cost items. As such, industries do not find it a profitable venture to start development and production. Investments for setting up such a production system are high, returns are not assured and low. In such cases, it is proposed that government/R&D labs should set up facilities for production of such systems and ask industry to operate them. This approach has the following benefits:

- Minimizes additional investments (a major concern of the corporate sector for fluctuating loads)
- Efficient management of facilities and increased productivity
- Enhanced assets performance

Micro Financing in Industry

Another approach to tackle this problem would be to promote micro finance in sensitive and strategic areas, particularly in industries which have basic infrastructure and the same requires upgradation technologically and augmentation for increased rates of production. This approach is essential to achieve sustainability in supplies to the armed forces. Modes of micro financing to private industry could be:

- Micro financing by government
- Micro financing by private institutions
- Availability of subsidized loans
- Operation of facilities on GOCO basis

New Engagement Model: R&D–Academia–Industry
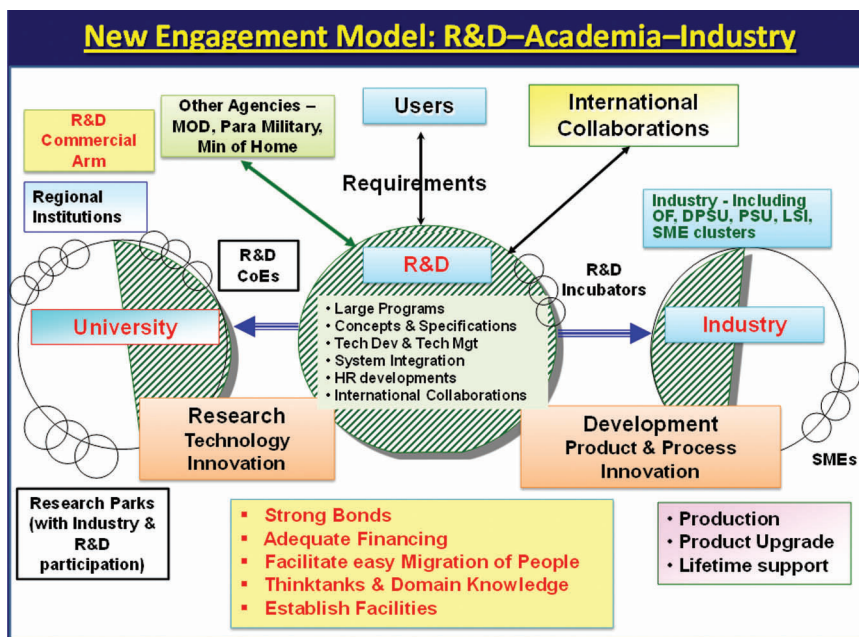
Figure 6

Figure 6 provides a model for engaging industries and academic institutions in development of technologies from TRL-1 to 9. However, a cluster approach is proposed, wherein around major regional universities/ academic institutions one needs to create clusters of SMEs or research parks with participation of industry and R&D. This initiative has recently been taken by DRDO at IIT (Chennai) Research Park to facilitate R&D and technology development with participation of regional industries (SMEs generally) and regional academic institutions. While R&D labs will have major stake holding in this venture, the collaboration with SMEs will be extremely useful to annul the stigma that "universities can develop but they do no deliver". This approach will also be used to set up centres of excellence with focus on research and technology innovation. It is expected that technologies upto TRL-4 may be attempted through this arrangement.

R&D centres will collaborate with medium and large industry partners for incubation of R&D culture in such industries through development programmes requiring product development and process innovation. The industry canvass will cover public, private and ordnance factories and SME clusters, all part of a level playing field based on technological capabilities rather than merely on the cost factor. R&D will encourage international collaboration to bridge the technology gap and also facilitate international collaboration in a tripartite mode with Indian industry partners.

Users which includes armed forces, para-military forces, home-land security forces, etc., would interact with R&D centres for coordinating technology development based on their requirements. This does not mean that users may not directly interact with industry. However, this direct interaction would require a strong technology, knowledge base and programme management to oversee these interactions at service headquarters. Even the R&D centres would have to enlarge their interaction mechanisms multifold, to handle the ever growing demand from users. Many R&D centres should set up commercial arms to handle the productionisation, marketing and product support, the tail end activities of product life cycle management

Users will have to accept the *spiral development* philosophy to facilitate growth of indigenous technologies and increase self-reliance. R&D and industry, then, will have the motivation to deliver Mk-I in the required time frame and develop Mk-II without waiting for repeated discussions and contracting delays. The world over spiral development in high technology areas has been practiced with excellent results.

Finally, this model would require strong bonds among the three stake holders through share of funding in an appropriate manner. Shared funding would ensure commitment to indigenous development. Together they should rise or fall. This approach also demands easy and purposeful migration of scientists, service officers, engineers, technicians, professors and students from one centre to the other. This will harmonise the process of development and the impermeable walls existing between institutions would become porous for easy flow of knowledge and ideas, and efficient utilization of costly facilities.

Engineers/scientists/technicians from R&D labs and industry should be deputed to operational units, workshops, repair centres of services for understanding the nuances of technology solutions and features required by services for user and environment friendly and maintenance free equipment for effectively performing the task at hand.

This proposal should be backed by resolution of all issues concerning IP, contracting risk/redundancy management and cost sharing upfront, to reduce delays in implementation in an autonomous manner.

Measures to be Taken by All Stakeholders Including Government to Improve the Eco-System
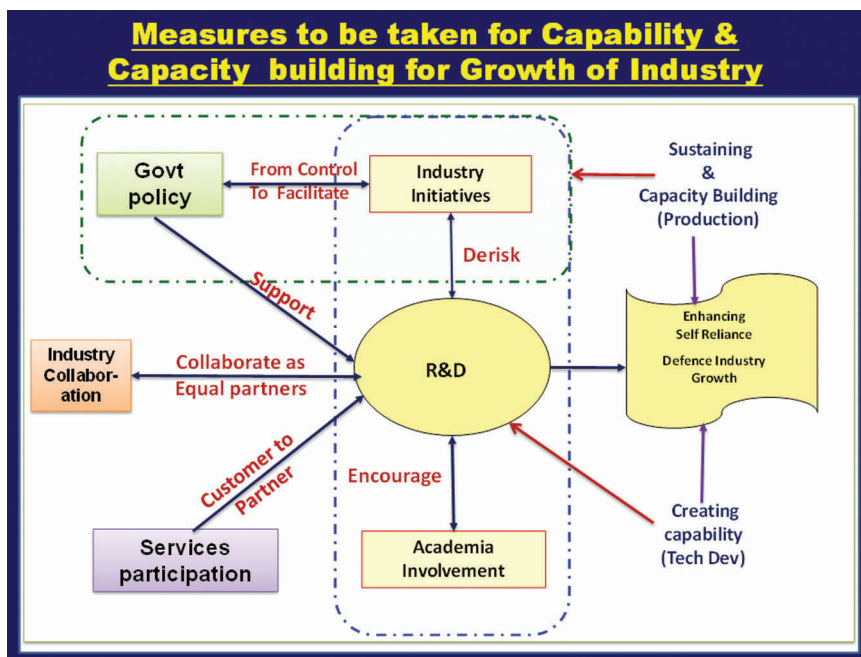
Figure 7

Figure 7 provides the steps to be taken for improving the eco-system for building capability and capacity building for the growth of the aerospace and defence industry in the country.

Government should facilitate industry initiatives rather than controlling them. Industries should function in an autonomous mode. It should support R&D initiatives in all R&D centres whether they are in the public domain or private sector with the bottom line that failures are part of the development process and these should be accepted as much as successes.

Large R&D centres should do handholding of industry as collaborators and derisk their efforts through technology backups, mentoring, analysis of failures, review of designs/development programmes, making costly

test facilities available to industry and finally entering into contracts on a *cost-plus basis* for development. However, this would require that the accounting/costing system of all industries be made transparent and a committee with the participation of CAG appointed auditor/IFA/addl.FA should oversee the details of man-hour costs, logging system in industry and profit margins, etc. This would go a long way in solving the problem of enormous delays in contracting and one can follow, L1, T1 route rather than L1 alone.

R&D centres should encourage academic involvement and be equal partners in research programmes, rather than reviewing them once in a while and waiting for results without any commitment.

User services should be considered as partners rather than customers. Commitment of the user for the success of the programme should be unhindered and without any conditions. It should be kept in mind that self-reliance in defence equipment is the joint responsibility of all stakeholders and not of R&D alone.

Industry should set up design and research centres for technology development, technology absorption, technology collaboration and for carrying out the task of productionisation, process innovation, product support and take measures for technology obsolescence without going back to original R&D centres, collaborators or technology providers. Cross movement of professionals from R&D and universities to industry and vice-versa would catalyse the process of creating R&D capability in industry.

National Aerospace and Defence Commission

Sixty years of efforts by our country in building indigenous technologies and bringing self-reliance in the crucial area of aerospace and defence, have paid rich dividends in terms of excellent industrial growth, excellent academic institutions and excellent R&D centres. However, since technology is continuously growing, the gap also widens despite our best efforts. The need of the hour is to consolidate the disjointed efforts, remove disconnects among stakeholders by laying down a strong policy frame work and creating the right/effective eco-system for accelerated growth of this sector.

It is proposed that India should set up a *National Aerospace & Defence Technology Commission* to coordinate, review, prioritize and take decisions on investments, collaborations, joint ventures and acquisitions, export and give directions to aerospace and defence production for improving the

country's self-reliance, and GDP to find the rightful place as a developed nation in this sector against global competition.

<div align="center">**Conclusion**</div>

Despite missing the Industrial Revolution of the 19th Century, no industrial base existed in pre-independence and very slow industrial growth post-independence till 1970-80, yet defence research and development activity has done exceeding well in developing technologies in the area of missiles, radars, EW systems, sonars, armoured vehicles like MBT, life sciences, unmanned aerosystems, propellants, explosives and strategic systems, materials and electronics, to the extent that the production value of indigenously developed product has reached more than ₹ *1,65,000 Cr* in the last 5-8 years and the *Self-Reliance Index has shot up from 30 percent to close to 45 percent and more. This is no mean achievement.*

However, there are still technology gaps in many areas and the urgent need is to bridge the same in an accelerated mode to ensure that India does not remain a follower of technology and our import of defence equipment comes down drastically. This requires identification and acceptance of facts that India still has:

- Inadequate design capability in critical areas like aircraft, gas turbine engines, long range electronic scanning radars, robust cyber proof computing and communication systems, robotics and unmanned systems (air, water and land).
- Disconnect between R&D and production.
- Level playing field between private enterprises and public funded institutions does not exist in practice despite many efforts by the government of India.
- Impact of Valley of Death syndrome in terms of conceptual design/innovation not reaching technology maturity levels and products developed by R&D centres not reaching the market.
- University/academia teaching and research portfolio is not focused on being design centric and innovation intensive features which are essential for development of technology and human resources.
- The eco-system does not support industrial growth, and R&D in industry, low volume – high input cost of production, synergy among academia, industry, national labs and user agencies like the armed forces.

- Very low investments in defence research and setting up critical infrastructure for development, testing and manufactur of defence systems (aero, electronics/micro electronics, materials, automation and robotics, etc.).
- Not leveraged the "off-set" provisions to acquire high end technologies for bridging the gap.

Unless we take strong policy and implementation decisions in all these areas, create new models for *shared responsibility for development of defence equipments* among stakeholders, create the right eco-system, and make investments and collaboration decisions immediately, it is felt that the technology gap will continue to widen, and we will remain the largest importers of weapons and equipment in the world. There is an urgent need for re-engineering academia, industries and research laboratories and transforming users from a customer to partner with preference for indigenous products and adopting the strategies discussed in this article for accelerated growth of defence technologies.

To give a concrete shape in terms of policies and plans, it is further felt that a *National Commission for Defence and Aerospace* should be set up to laydown policies, coordinate development and production, laydown priorities, make decisions on investments, collaboration, acquisition of foreign technology centres and exports, create a strong industry base for defence equipment in the country and finally guide this great country to compete globally and find its rightful place as a technology leader among the developed countries in the world.

Future is bright. Let us work together to make India a super power in the strategic defence sector.

Dr. V.K. Saraswat

Dr. Vijay Kumar Saraswat, a renowned scientist, has more than four decades of experience spanning over several fields and areas in both basic and applied sciences of defence research. Apart from being a scientist, he is a rare combination of an innovator, technologist and a visionary.

During his illustrious career, from Scientist to Scientific Adviser to the Defence Minister, Director to Director General DRDO and Secretary to Dept of Defence R&D, Dr. Saraswat has been credited with development of Liquid Propulsion Rocket Engines and missiles namely PRITHVI, DHANUSH,

PRAHAAR indigenously. He is the principal architect of the ballistic missile defence programme which included major technology breakthroughs.

Dr. Saraswat has brought new dimensions to the strategic defence scenario through successful test firing of AGNI-5; SHOURYA; Initial Operational Clearance for Light Combat Aircraft TEJAS and induction of INS Arihant.

Under his leadership, DRDO has been transformed from a technology importer to a pioneer in providing integrated technology and process solutions on weapon delivery platforms.

Dr. Saraswat's pioneering efforts have taken shape in the establishment of the Research & Innovation Centre at IIT Madras; MILIT- Centre for Training needs of the armed forces on S&T; CERT for reporting, auditing and handling emergency response of information security incidents; CHESS – futuristic technology centre for high energy laser and microwave devices and many other such centres.

Dr. Saraswat presently is the DAE Homi Bhabha Chair Professor and shouldering many more key positions in government and academic institutions.

Dr. Saraswat is the recipient of many national and international awards including, the Padmabhushan (2013), Padmashri (1998), Vikram Sarabhai Memorial Award from the Indian Science Congress (2011); Jawaharlal Nehru S&T Award (2009) by the Government of Madhya Pradesh; FICCI Annual Award; Academician of International Academy of Engineering, Russia (2007), ARYABHATA Award (2011) from the Astronautical Society of India and National Aeronautical Prize (1998) to name some.

Dr. Saraswat is also a Fellow of many professional bodies including the Indian National Academy of Engineering, Aeronautical Society of India, Institution of Engineers, Astronautical Society of India to name a few. Honoris Causa has been conferred on him by more than 18 universities including Andhra University and NIT. He has also authored and presented several papers at national and international conferences.

India's Maritime Strategy in the Emerging Global Order

Admiral (Retd.) Arun Prakash

AN EMERGING MARITIME POWER

The Indian Navy (IN) can rightfully claim that, although the smallest of our armed forces, has displayed uncommon vision and strategic sense, to create a special place for itself in the national security matrix. Three specific measures have helped the Service raise its own and the country's profile internationally; it opted for a growth model focused on indigenous development and production; it set its sights on a strategic vision of regional maritime influence, rather than on immediate tactical-level threats; and most significantly, it crafted, for itself, an intellectual underpinning to rationalize and synergise its endeavours by writing a maritime doctrine as well as strategy.

It was also fortuitous that the past decade and a half witnessed a "maritime awakening" amongst India's traditionally land-oriented decision-making elite. A series of developments, including the ongoing phenomenon of globalization, the drama of rampant piracy, the traumatic exposure in November 2008, of India's soft coastal underbelly, and the spectre of a growing PLA Navy served to sharply focus on maritime security. The growth of the IN has, for some time now, been described by foreign observers as "rapid" or even "dramatic", and they seek to examine the deeper nuances of India as a geo-political entity, staking claim of being a maritime power. The heightened level of external interest in the IN has led to a number of studies, papers, monographs and books.

Indians are puzzled by the close scrutiny into the navy's modernisation, and by suggestions that its growth may "jeopardize" regional stability or "trigger an arms race"; especially, since such views run contrary to our own perception of the process as innocuous and even beneficial for the region. A little reflection, however, shows that there could be a number of reasons for this curiosity and the diverse interpretations emerging from it.

First, the significance of navies has always been underestimated in India. So far-reaching are the implications of maritime power, that any alteration in the existing naval balance must receive full scrutiny for all its nuances. Second, there are a few historical precedents, apart from Czarist Russia and Wilhelmine Germany, for a traditionally "continental nation" to display such maritime ambition. And finally, it is possible that this curiosity is tinged with resentment about a poor third world nation aspiring to enter the seagoing "big league".

An interesting feature of these investigations is the tendency amongst researchers to try and match Indian thought processes and actions with known and familiar paradigms as set out by strategists like Clausewitz, Mahan or Corbett. However, Indian mores, culture and even history do not always lend themselves to interpretations that are familiar to the Western intellect. Many IN officers, who have read and who admire Mahan's writings, feel that his analysis of 18th century British naval campaigns and many of his exhortations about deployment of overwhelming naval power may not have much relevance in the 21st century maritime context.

In this context, two assertions by western analysts sound somewhat presumptuous to Indian ears: (a) that a nation state needs a "grand historical narrative" to justify a naval build up, and (b) that it is imperative for "expensive navies" to represent the manifestation of a nation's political and strategic culture. Since our mores, customs and history do not always lend themselves to interpretations that are familiar to the western intellect, efforts to fit Indian developments into familiar, but inappropriate templates, may lead to erroneous conclusions.

Given that reservations of this nature are often seen in print and voiced in various forums, this article attempts to address them; not so much to convince foreigners, as to instill conviction amongst our own intelligentsia that India's maritime rise is not the whimsical fancy of an ambitious growing power, but the revival of a hoary tradition whose origins go back in antiquity. It then dwells upon the strategic culture and environment in which such a revival has occurred, leading to the evolution of a navy as well as a maritime strategy. The concluding part of

the article highlights salient components of the maritime strategy in the context of the emerging global environment.

ROOTS OF INDIA'S MARITIME GROWTH

Not enough is known about our ancient maritime tradition because our past suffers from a lack of historic documentation. For this reason, we have had to accept accounts, authored by Western historians, which rarely make mention of the seafaring skills of the ancient Arabs, the Chinese, or Indians. A lone Indian voice in India's historiographic void is that of Sardar KM Panikkar; statesman, diplomat and visionary.

According to Panikkar, due to the earlier civilization and predictable system of monsoon winds, it was the Indian Ocean region, and not the Mediterranean or Aegean Seas, which saw the world's first oceanic sailing activity. A fascinating picture emerges as Panikkar describes the elaborate system for control of maritime activities instituted by the 4th century BCE Mauryan Empire. He then provides evidence that the waters of the Bay of Bengal witnessed a continuum of commercial colonization, as well as cultural and religious osmosis by sea from India's east coast ports to south-east Asia. The existence of Hindu kingdoms right across SE Asia who followed Indian religious, cultural and economic practices is still vividly evident in the architecture, culture and religious beliefs of this region. All this often comes as a surprise even to many Indians, because they are unaware of the ancient cultural linkages that bind us to South East Asia, and fewer still are conscious that such linkages could only have been sustained through intense maritime intercourse by intrepid Indian seafarers over centuries.

When Vasco da Gama anchored off Calicut in May 1498, he became the first European to reach India by sea, and this marked the beginning of a 500-year long dominance of Asia by the west. Soon after the arrival of the Portuguese, their relations with the Zamorin of Calicut deteriorated rapidly, and open naval conflict broke out between them at sea. For the next 90 years, the small coastal Malabar fleet, under the outstanding leadership of Admirals of the Marakkar clan, kept up an unceasing struggle, harassing and frustrating the Portuguese at every turn and eventually driving them north to Goa.

By the beginning of the 18th century with the Moghul Empire in terminal decline, the Marathas, anticipating, that control of the seas would be critical in the forthcoming conflict with the Europeans, set about

creating a fleet and fortifying the Konkan coast. An outstanding sailor named Kanhoji Angre became Admiral (or *Sarkhel*) of the Maratha navy's force of lightly armed but agile, shallow-draught vessels (known as *ghurabs and gallivats*) which dominated Konkan territorial waters and harassed European shipping. Individually and collectively, the British, Dutch and Portuguese navies, mounted repeated attacks on Angre's strongholds but were repulsed on each occasion; earning him the encomium from the English historian Kinkaid: "Victorious alike over the English, the Dutch and the Portuguese, Angre sailed the Arabian Sea in triumph."

This detailed recitation of events from India's past was meant to establish that India's maritime heritage goes back to well beyond the Elizabethan era, that is considered the starting point for British naval power, and predates the exploits of the Vikings in the North Sea and those of the Greeks in the Aegean. Having delved into ancient history, let me spend a few more minutes on the more recent past to bring you up to date with today's navy.

Recent History

In the aftermath of WW II the British were haunted by the security implications of Soviet Russia resuming its quest for a warm water port in the Indian Ocean. The British Chiefs of Staff had hoped to retain the subcontinent as a Western bastion, in which the navy of an independent India would form the first line of maritime defence against a possible Communist advance. Equipped with surplus Royal Navy ships, the Indian Navy was visualised as an useful component of a Commonwealth task force in the Indian Ocean region.

Subsequent developments, including India's adoption of a "non-aligned" stance, its financial difficulties and outbreak of the Korean War, saw just a single British aircraft carrier, and a handful of cruisers, destroyers and frigates being transferred to India by 1961. For a newly independent nation, this constituted a significant nucleus upon which to build a navy. Visionary IN leaders laid the foundations of a balanced blue water navy by adding aviation and submarine arms and a maintenance infrastructure.

For the first few postindependence decades, however, the continental orientation of the administration ensured that budgetary allocations were based on the presumption that the main threats were landbased, and the IN had to survive on a succession of shoestring budgets. It was only in the decade of the 1980s that India undertook the long delayed

naval acquisition programme under which the IN inducted a second aircraft carrier and a nuclear attack submarine (SSN) on lease, along with numerous warships, submarines and aircraft. Concurrently, a proactive political approach saw transnational naval and military deployments in neighbouring Sri Lanka and the Maldives.

Before the Indian economy hit a series of speed breakers from 2009 onwards, most projections showed that India's prevailing GDP growth rate would place it amongst the world's three largest economies; with consequential benefits for defence spending and maritime security. However, even if India's reduced GDP growth rate demands a cautious approach, the capability of the acquisition plan, to which the Government of India is already committed, will place the IN amongst the front ranks of modern and potent maritime forces within the next two decades or so.

Having established India's historical maritime credentials and traced the navy's recent growth, let me now address a second area that attracts critical scrutiny. Questions are often asked about the evolution of a maritime strategy in the absence of an overarching Indian grand strategic thought process. Seeking a response calls for a brief look at India's strategic culture.

INDIA'S STRATEGIC CULTURE

India's strategic culture was studied 21 years ago, by the American scholar, George Tanham, who stirred a hornets' nest with his monograph that analysed the historical, geographic, and cultural factors influencing strategic thinking in this country, and examined whether Indian thinking follows consistent logic and direction. Drawing pointed attention to the historic lack of a strategic thought process in Indian society, Tanham postulated that a combination of "lofty Hindu philosophy and a fatalistic outlook, combined with the constraints of the caste system", had historically hindered the Indian mind from looking too far ahead.

Tanham's conclusions did not go down well with the intellectual elite, and his diagnosis of "strategic myopia" has been disputed. One of the arguments offered is that India's survival as a civilizational, cultural and political entity through centuries of foreign invasions and turbulence is proof enough of a strategic culture. A view has also emerged, which asserts that right from the moment of independence, India has never been without a clear cut grand strategy. Crafted by Nehru, the main components of this strategy were the preservation of India's political unity, the protection

of its territorial integrity against internal and external threats, and the quest for economic development. The choice of democracy as the form of government, and the adoption of nonalignment, as foreign policy, were complementary strategies.

While this interpretation is certainly encouraging, the fact remains that there are few records of coherently articulated beliefs or the enunciation of national aims and objectives, rooted in the vision of the nation's place in the world. In the 66 years since independence, India has never issued a defence White Paper; nor have interests and objectives relating to national security been formally articulated. As a consequence, the armed forces have had no choice but to extemporize in a strategic void.

The approach of Indian statesmen to national security provides tell-tale indication of the underlying causes. The sheer intensity of political activity in India makes great demands on a politician's time, and he views matters pertaining to national security or to strategic affairs as tedious and time consuming – best left to the bureaucracy to handle. This allows him to devote his time and attention to complex activities relating to his political survival. That is why difficult decisions relating to issues like integration of the armed forces, or creation of a Chief of Defence Staff have remained in limbo for decades.

It is against this background of a hiatus in strategic culture and the detached attitude of the political establishment that the leadership of the Indian Navy has, for decades, pursued a maritime vision. The past decade has also seen the IN undertaking the creation of a doctrinal and strategic framework for employment of maritime forces in peace and in war. Let us cast a sweeping glance at the global environment in which the 21st century IN will operate.

OUTLINES OF THE EMERGING GLOBAL ORDER

In the midst of worldwide political turmoil, crystal gazing has become a hazardous undertaking. Those who thought that the Socialist dream had died in 1989, do not know what to make of the strange mutations that Communism seems to have undergone. The Peoples Republic of China, by converting state socialism into state capitalism, has preserved the essentials of Marxist dogma and authoritarian rule for a sixth of humanity. Even as China races towards prosperity, the Russian Federation has returned to its dictatorial tradition and evolved a unique form of governance, tailor made, by Vladimir Putin and his oligarch comrades.

The great expectations generated in the Middle East and North Africa by the so called "Arab Spring" have turned out to be a false dawn. The upheavals in Tunisia, Egypt, Libya and Yemen have merely resulted in autocracies being replaced by hardline Islamist regimes whose commitment to democratic values remains dubious. In the case of Egypt, the struggle between the army and the Islamists is fraught with danger and uncertainty. The three year old Syrian conflict has become a confused and sanguinary civil war being fought by proxies of external powers in that unfortunate country.

Rising populations accompanied by increasing industrialization and urbanization, regardless of global economic uncertainty, are bringing sharp focus into resource availability. Pressure is already being felt on a number of highly strategic resources, including energy, food, and water, where demand is projected to outstrip supplies over the next decade or so. As we can see, the future is replete with challenges of every type – natural as well as manmade – and the Indo-Pacific region, which constitutes the "extended habitat" of the IN, will witness the impact of most, if not all.

INDIA'S MARITIME STRATEGY

The Indian Navy's four basic missions, which span the full spectrum of conflict, have been clearly spelt out by its Doctrine. They encompass military, diplomatic, constabulary, and benign roles. Of these, the diplomatic, constabulary, and benign roles are clearly undertaken in peacetime, but within the ambit of the military role, deterrence is a function that spans both peace and war.

The IN aims to achieve conventional deterrence by maintaining preponderance in maritime capability; i.e. sufficiency of warships, submarines and aircraft which will undertake the full gamut of operational missions; the idea being, to never leave friends as well as potential adversaries in doubt about India's capabilities at sea. Given the dominant location of peninsular India, astride Indian Ocean sea lanes, such a maritime force can guarantee the safety of our own as well as international trade and energy lifelines.

Deterrence, on a grand strategic plane, involves deployment of nuclear weapons as political instruments of state policy; their actual use being contemplated only "in extremis" in a second strike mode. Having crossed the nuclear Rubicon in 1998, India is now committed at maintaining a minimum credible deterrent under a self imposed condition of No First Use (NFU). The recent launch of the nuclear propelled SSBN *Arihant* is

the first step towards acquiring the third leg of the "nuclear triad" pledged in India's Nuclear Doctrine. This event lends a new dimension to the navy's stature as well as outlook.

Operating a viable submarine based deterrent is a complex undertaking and requires many components. It must have a number of SSBNs armed with nuclear tipped missiles of intercontinental range, as well as a small force of nuclear attack submarines or SSNs for protection of the deterrent and for interdiction of shipping. Such a mix of SSBNs and SSNs, once at sea, will invest India with the strategic autonomy that it seeks, and the means to forestall attempts at maritime hegemony or domination of the Indian Ocean Region.

The Strategy envisages a "commodity denial" or "indirect" regime, whereby maritime forces are deployed to interdict the enemy's foreign trade and energy lifeline in an attempt to starve his industry, economy and people and, over time, bring his military machine to a halt. The impact of this requires finite time to take effect. Factors like the enemy's dependence on imports, his buffer stocks and ability to restock via land routes will decide the effectiveness of these indirect operations, and that is why navies need a prolonged war to create a substantive impact.

In the other, "direct", mode of creating an impact on land battles, contemplated by this strategy, the enemy's homeland is targeted by naval platforms (ships, submarines and aircraft) delivering ordinance from seawards, undertaking amphibious operations, or inserting Special Forces. Adapting these concepts to the Indian environment, the Maritime Strategy encompasses the resolute and judicious deployment of maritime forces in both direct and indirect operations. This aims to ensure that the impact of sea power is felt on land battles, both in the short term and long term.

Against this backdrop, and given the transnational reach and versatility of maritime power, not only is the IN going to find greater salience in India's national security matrix, but will also play a vital role in sustaining India's economic prosperity. India's long term maritime strategy or roadmap, therefore, requires special focus on certain vital factors, of which major ones are spelt as follows.

SUSTENANCE OF FORCE LEVELS

As a regional navy with limited aspirations of safeguarding national interests, the IN would, probably, aim for a stabilized strength of about

150-170 ships and submarines, and possibly 350-400 aircraft, helicopters and UAVs. A look at some of the recent additions to the IN order of battle, as well as hardware in the pipeline is educative.

India launched its first nuclear powered ballistic missile submarine in 2009, and at least 2-3 more will follow, with longer range missiles. A Russian nuclear powered attack submarine was delivered in 2012 on a 10 year lease. The IN is expecting the long-awaited delivery of the refurbished Russian aircraft-carrier *Gorshkov* by the year-end, while a second carrier is being fitted out in Cochin. On order are: seven stealth frigates, six diesel submarines, eight P-8 maritime patrol aircraft, 45 MiG-29K fighters and 30 other warships. All these items signify a committed expenditure in the region of US $ 30-40 billion, in the next decade, on naval hardware of strategic significance.

While the IN may appear to be one of the fastest growing maritime forces worldwide, the picture is not entirely rosy for two reasons. First, the public sector shipyards have not risen to the occasion and their slow production rates will be inadequate to sustain the desired force levels. In fact, the force levels of submarines, surface escorts and mine counter-measure vessels may already have reached the minima. Second, the Russian arms industry, on which the IN is heavily dependent, suffers from numerous problems, and the consequences, in terms of quality, delayed deliveries, cost overruns and poor product support, are going to tell adversely on the navy's combat readiness in the years ahead.

Charting out an effective strategy to ensure timely replacement of ageing platforms, by Indian and foreign shipyards, and maintaining combat readiness of imported systems will represent the navy's biggest challenges.

Indigenous Technology

A closely related aspect and a second area of concern is the low level of home grown technological inputs into our indigenous warships. Despite the Navy's determined support to indigenous industry, the fact is that we remain woefully dependent on countries like Russia, Israel, France, the UK and, now the USA for acquisition of weapons, sensors and other naval systems. Such dependence creates a dangerous security paradigm in which every new weapon system that we acquire from abroad makes us dependent for the life time of the system on a foreign country. This country is then free to coerce or blackmail us as far as availability of spares

and prices are concerned. Under such conditions, India's ability to exercise "strategic autonomy" remains severely constrained.

The failure to acquire even a modicum of selfreliance in major weapon systems in the past 66 years has made India the biggest importer of arms worldwide; and this must count as the biggest failure of DRDO and DPSUs. This is in spite of the navy's firm commitment to indigenization and steadfast support to the DRDO. Crafting a viable and time bound strategy which will persuade the DRDO to develop, reverse engineer or import technology for weapons and sensors for our indigenously built warships will constitute another major challenge for the IN.

Foreign Cooperation

While frequently expressed concerns about China's putative "string of pearls" strategy may be justified, the question that hangs in the air is this: in pursuing this strategy China's is acting in its national interest, therefore what are our diplomats and decision makers doing to counter it? Here again, the Maritime Strategy has much to offer because "Foreign Cooperation" forms an integral component.

In the maritime context, foreign cooperation has wide connotations and covers a whole range of activities. While exercises establish navy-to-navy rapport and interoperability, jointpatrolling builds confidence, port calls and flagshowing deployments enhance bilateral goodwill and understanding. Countries in our immediate neighbourhood, many of them island nations, seek maritime security, sometimes through direct naval presence, but more often through urgent requests for material aid, training assistance and advice. Responding to such requests in a reasonable timeframe requires close coordination between NHQ, MoD and MEA – which is not always forthcoming.

After its sterling performance during the 2004 tsunami, it will be the unstated expectation of our neighbours that the IN will promptly come to their assistance in times of natural calamities, and the Service must prepare and equip itself to render prompt humanitarian assistance and disaster relief (HADR). Foreign cooperation should, therefore, form a vital component of the IN strategy, not only to enable it to create friends and partners, but also to familiarize itself with future battle-space.

Networked Operations

Today, the IN is in a situation where it fields weapons of formidable capability whose range exceeds that of its sensors. Its platforms operate in

three dimensions over a vast geographic area extending from the Persian Gulf to the South China Sea. During peacetime, the Commander at sea is keen to have a composite three-dimensional picture of maritime activity, not only in his own area of responsibility, but also in other distant locations of concern.

In operational situations, the Commander's sole objective will be to locate, identify and destroy the enemy. In such a scenario, the ability of units to network closely and exchange intelligence as well as sensor and weapon aiming data with each other, assumes crucial significance. Only then can the Commander hope to benefit fully from remote sensor data, make optimal use of long-range weapons and get "inside" the adversary's decision making loop.

The secure, high speed link for such a network will come from the dedicated geo-stationary satellite (GSAT-7) recently launched for the IN whose footprint covers its area of interest. While powerful platforms with potent weapons and sensors may provide the required muscle to the IN, it is networking which will be the catalyst to lift the IN into the big league of navies.

Conclusion

For all its ancient history, culture and inherited wisdom, India remains a young nation state, still tentative and unsure about the use of its growing power. India's strategic perspectives are influenced neither by the aspirations of Lord Curzon, nor by theories of Thomas Hobbes and Kenneth Waltz. Perhaps not even by Kautilya's.

The unvarnished truth is that India's evolving democracy has generated a unique blend of politics whose intensity makes huge demands on the politician's time and mental space. So immersed is he in domestic issues that that his horizon extends only to the next election. Formulation of strategy and policy is left to the bureaucrats, diplomats and scientists; none of whom can be expected to demonstrate any grand flourishes or visionary initiatives; especially in the absence of political guidance.

The Maritime Strategy has evolved through the vision of India's naval leadership with its gaze firmly focused on national maritime interests and regional stability. This paradigm will prevail till, in the fullness of time, the politico bureaucratic establishment acquires the capacity to address national security issues with the seriousness and attention they deserve.

Admiral (Retd.) Arun Prakash
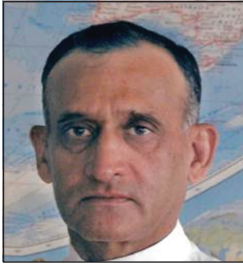
Admiral Arun Prakash retired as India's 20th Naval Chief and Chairman Chiefs of Staff in end-2006. Commissioned into the Executive Branch in 1966, he specialized as an aviator and has flown fighters from aircraft carriers and MR aircraft and helicopters from ashore.

During his 40 year career, he commanded four warships, including the aircraft carrier Viraat, two naval air squadrons and a naval air station. In flag rank he commanded India's Eastern Fleet, the National Defence Academy, the Andaman & Nicobar Joint Command, and the Western Naval Command. In staff assignments he served as ACNS (Air), ACOP (CP), COP and Vice Chief of Naval Staff.

A graduate of the IAF Test Pilots School, the Defence Services Staff College and the US Naval War College, he was awarded the Vir Chakra for gallantry during the 1971 war, while flying with an IAF ground attack squadron.

Post retirement, he writes and speaks on strategic and defence related topics. He has served as Chairman of the National Maritime Foundation and as a two-term member of the National Security Advisory Board.

Civil-Military Relations in India
An Unending Saga of a Deepening Crisis and Time for a New Beginning

Air Marshal (Retd.) Brijesh D. Jayal

INTRODUCTION

To observers of the national security landscape, the recent adversity that has been visible with respect to relations between civil and military institutions must be cause for alarm. Even as this article is being written, the nation awaits clarity on claims and counter claims that have occupied public space on what can only be called an avoidable spat between an ex army chief on the one hand and the MOD and Army HQ on the other. Ever since in a dubious first, a serving army chief took the MOD to the Supreme Court, events that are being fed into the public domain are so grave as to cause unease amongst the people. After all, when public allegations are made of suspicious movement of troops around the capital, of the army snooping on communications of the defence ministry, of it setting up an unauthorized intelligence gathering unit and even attempting to destabilize a duly elected state government, then it is evident that civil-military relations have reached a dangerous low. Add to this the increasing frequency of collective indiscipline within army units and an increasing number of suicides, and the picture is one of concern.

That the political executive appears to have made no apparent attempt to take charge of the situation and assuage public concerns and that Parliament has not thought fit to hold the executive to account on behalf of the people, leaves one wondering where national security management

is headed. This uncertainty has already caused immense damage to the prestige and morale of the institution of the armed forces on the one hand and the generally unruffled civil military relations of which Indian democracy has been a flag bearer, on the other.

It speaks volumes for the civil institutions of our democracy that there is no battle cry for the truth to be unearthed quickly, the public taken into confidence and the wrong doers, whichever side of the divide they may be, brought to book. Two wounded institutions of democracy appear to be licking their wounds and the people are left wondering what bad news the next salvo will bring.

If proof were needed of the gravity of the state of affairs, random reports from three national dailies on the same day are perhaps a pointer. One daily reported yet another incident of a clash between soldiers and officers in an army unit where the second in command was injured. It recalled three similar and earlier incidents respectively in a Cavalry unit in Punjab in 2011, an artillery unit in Nyoma in May 2012 and in an armoured unit in Samba in August 2012. The report commented that these incidents had forced deep introspection about the command and control system of the army, with instructions being passed to officers in units to adopt a more humane approach and understand the changing socioeconomic situation of the nation.[1]

An editorial in another daily commented on several recent attacks by both the Pakistan army and terrorists on the Indian Army in Jammu and Kashmir, and reflected on the perception that all did not appear well within the army asking it to come clean on what actually transpired, and to introspect on whether slackness and incompetency could be reasons for its recent susceptibility to terror attacks.[2]

The third report points to an equally disturbing picture when viewed from the perspective of the highest institution of democracy, namely Parliament and those who represent the people. Reportedly, as a result of general unease in the media and public domain on the deteriorating security situation on the border, an important meeting of the Parliamentary Standing Committee on Defence was called to review "the threat perception and preparedness of the forces including incursions on borders". The Defence Secretary and senior officers of all the three services were to brief and field questions from Parliamentarians. But, midway through this briefing, the Chairman of the committee, abruptly announced that the meeting was being wound up because some members had to catch their flights.[3] This cavalier approach to national

security by the representatives of the people, when clearly the national mood across the country is one of deep concern, merely highlights the fissures.

Between 2003 and 2011, there were 1054 cases of suicides reported in the armed forces. Yet, when the suicide of a soldier from Kerala was raised in Parliament, the MPs were urged not to have a discussion saying: "This is a very small incident, which is being blown out of proportion. It is not good for the morale of our armed forces."[4] Yet another example of our casual attitude towards the health of our military institutions.

CIVIL-MILITARY RELATIONSHIP – PRINCIPLES

To look at the issue of civil military relations in a broader context, it is worth mulling over some of the principles that should govern such a relationship. In an article titled "*Institutional Challenges Facing the Armed Forces – The Moral and Ethical Dimension*"[5], this writer had reflected on some of the following issues.

'Whilst it is the political executive that will make a judgment about going to war and be accountable to the people, it is the military that is accountable to society for conducting a just war. An important input to decision making about war, however, must come from the military leadership who, at the end of the day, will not only bear the direct consequences of the decision, but are also accountable for achieving the objectives of war. For the military, it is vital they act in a manner that conveys to the political executive that they operate under orders of the latter, and yet ensure that a military perspective is presented honestly and unambiguously without, in any way, appearing to force their viewpoint.

Military leaders must be free to represent the unique perspective of the armed forces with no hesitation of it being misunderstood. On their part, political leaders are morally bound to be well informed about wider military policy and to provide the right organizational and resource support to ensure that the military's capability and the needs of its professionals are adequately met such that they are mentally and physically prepared to respond when called upon to do so. Beyond the political military plane at the executive level, in a democracy, it is Parliament that must represent the moral voice of society in this sacred partnership.

Whilst a democratic society thrives on human rights, in exceptional circumstances it is willing to curtail these rights when it calls its military in aid of civil authorities. The military in turn develops its own codes, ethics, professional expertise and skills conforming to moral values of society at large, whilst upholding the laws of the land. In fulfilment of this abiding trust between society and itself, every professional military person is honour bound to protect the sovereignty and integrity of the nation even at the peril to one's life. This is the oath that makes the profession of arms unique. The foundations of this contract of unlimited liability on the part of the uniformed fraternity for the larger good of society are based neither on the laws of the land, nor on rules of governance, but on mutual trust and moral and ethical conduct on the part of both parties.'

In an US paper "*Reframing Suicide in the Military*";[6] the authors make the point that civilian control over the military means that each member of society is ultimately responsible for what happens to its military members. They conclude, "Examining military suicides through a social and cultural frame demands that we ask questions about ourselves, our military institutions and service members and our policies that may yield uncomfortable answers. To shrink from that duty would indeed be to break faith with those who have sacrificed incomparably more in our name."

To summarize, in spite of separate domains of moral responsibility and the very different perspectives that the political and military professions may bring on many issues, with such relationships not always being smooth, both leaderships have the moral responsibility to be trustworthy, constructive and forthright in their mutual dealings. Alas, what we see happening in India is quite the opposite, and we the people of India are shirking from our duty of asking questions that may yield uncomfortable answers!

HISTORICAL BACKDROP

There is little doubt that the stage for civil military relations was set in India initially by the towering personality of Jawaharlal Lal Nehru. According to Srinath Raghavan, Nehru's views of keeping the military subordinate to the political authority "were shaped by his understanding of the pernicious effects of militarism in Europe and Japan".[7]

In the early years, the one controversy regarding civil military relations relates to the then army chief Gen Thimayya's resignation in 1959. Srinath writes[8] that to counter the growing threat from China, Thimayya wanted the political leadership to consider seriously the proposal mooted by President Ayub Khan for joint defence arrangements between India and Pakistan, which did not find favour with Nehru who felt that Thimayya's resignation was a form of pressure. Nehru was able to prevail on Thimayya to withdraw his resignation and whilst playing it down to temperamental differences, he stressed that "civil authority is and must remain supreme".

In a column, Shashank Joshi[9] mentions many examples of alarmism from the government about military intentions, most of them demonstrating not much more than civilian neuroses. He writes that Stephen Cohen, a South Asia expert at the Brookings Institution in the US had noted that senior intelligence officials claimed to have detected at least three coup plots by generals in recent years, including one supposedly by General K. Sundarji in 1987, but to quote Cohen "There is no credible evidence of such plots. But insecure politicians and bureaucrats, many of whom have a stereotyped image of the military, listen to these warnings."

Over the years, as events have unfolded in the neighbourhood, the political executive has preferred to keep the military at arm's length and coopted the bureaucracy as the middle men. As a result, the principle of subordination of the military to the civil political executive has degenerated into excessive control by the bureaucracy, which in turn has resulted in not infrequent examples of a supine, career-seeking and divided military leadership. The 1962 Indo-Chinese conflict, to a degree, was a consequence of this state of affairs, where not only was gross interference in military matters by the political leadership exposed, but also their absence of understanding of operational issues.

In another unique weakness of Indian security management, rather than permit scholarly and objective analysis of military and security events by declassifying military documents, the security system continues to shelter behind the Secrets Act. So it is with the Henderson Brookes Report that looked into the 1962 conflict. Fortunately, scholars and witnesses to the times have written enough on matters relating to civil military relations for some lessons to emerge.

Col Anil Athale, the official historian of India's War with China, writes[10] about Nehru facing a hostile opposition and wanting the army to do something, when an ambitious General Kaul who even figured as a possible successor to Nehru, proposed the bizarre idea of offensive action in the eastern sector, nearly 1,000 kilometres away from Ladakh, where the situation in terms of logistics was even worse than in Ladakh.

In his account of how India's political establishment and the army fumbled and fought in the run up to the 1962 conflict, Kuldip Nayar writes[11] about the then army Chief Gen. P.N. Thapar's advice to Nehru not to precipitate matters because of the unpreparedness of his forces and the pressure to change this view he faced both from the Cabinet Secretary and Krishna Menon till he finally acquiesced only to regret later. Nayar says that when he later asked Krishna Menon about the army chief's reservations his reply was: "That toothless old woman; he did not know how to fight a war."

To quote Athale: "But despite all this in a classic example of those chaotic times, on 22 September 1962, a joint secretary in the Ministry of Defence H C Sarin issued the war directive. It is an unworthy example of how not to go to war and therefore deserves to be quoted in full. 'The decision throughout has been as discussed earlier that the army should prepare and throw out the Chinese as soon as possible. COAS was accordingly directed to take action accordingly for eviction of the Chinese from Kameng frontier division as soon as he is ready.'"

Kuldip Nayar recounts[12] how when after the fall of Bomdi-La, Gen Thapar offered his resignation to Nehru, the latter responded, "Thank you, but this is not your fault". Yet the next day, Nehru not only reminded Gen Thapar of his resignation offer, but used it in the Lok Sabha ostensibly to assuage Parliament's anger against Krishna Menon. Nayar recounts Gen Thapar telling him some years later "Looking back, I think I should have submitted my resignation at that time. I might have saved my country from the humiliation of defeat".

Notwithstanding the 1962 humiliation, Nehru in his letter to Bertrand Russell refers to "the danger of the mentality spreading in India, and the power of the army increasing".[13] It is interesting that even a national military humiliation did not move a statesman of Nehru's stature to appreciate the damage that was being caused to national security by a trust deficit that was being promoted in civil military relations by a political executive fearful of an imaginary overbearing military.

In hindsight and with decades of not only progressive weakening of civil military relations, but also a conscious effort by the civil establishment to downgrade the status of the military, it is fair to conclude that had Gen Thapar resigned then, he would have set a healthy trend of sending a message to the political executive and the bureaucracy to treat the military with a greater degree of professional respect. He would also have set a moral bar for his successors in all the services. As we know, no successor in any of the services has found the moral courage to cross this line, although there have undoubtedly been many justified occasions for some to have done so for the larger good of the forces they have commanded, and for national security. More recently, had Gen V.K. Singh in his differences with the government over age, chosen to resign rather than approach the Supreme Court, he could have reset the moral compass that Gen Thapar regretted having missed.

It is worth recalling this history in some detail to understand how utterly distorted and weak are the nation's foundations with respect to civil military relations, where a mere Joint Secretary in the MOD could direct the army chief to war with the chief meekly accepting this diktat, where the Defence Minister held his army chief in contempt over his own pet Generals, where a statesman Prime Minister thought nothing of humiliating his army chief to score political points, and where Parliament stood idly by. And for good measure, the Joint Secretary rose to higher ranks, whilst the army chief was asked to resign and the entire army's reputation sullied.

It should surprise no one that Nehru lived to see the fabric of civil military relations begin to show considerable fraying in his own lifetime. Post 1962, not only did the political leadership face considerable flak for having interfered in matters that should have remained in the military domain, but the high handedness of the bureaucracy with little domain knowledge and coopting ambitious senior commanders into the political game plan, have all left institutional scars that will not heal easily. Something that does not seem to have been absorbed by the political leadership with the result that today when deep civil military fissures have again become visible, students of national security are hardly surprised.

THE US EXPERIENCE

Whilst conflict between the civil and military components in Western democracies may not always be apparent, it does exist across nations. Raj

Shukla[14] quotes that in the US since WW II, there have been seventy-eight documented cases of major conflicts between the civil and military leadership. He makes the point that the critical difference between them and the Indian experience is, that in their case such conflicts are subject to intense introspection resulting in reform and an ever evolving model of civil military relationship. Shukla attributes this to the following. One, that in the US the political executive, the Congress and the military engage far more robustly on strategic and military issues strongly aided by academia, think tanks and the media. And two, within their system, the armed forces are continually under pressure from their two masters, namely the political executive and the Congress to reform, and that they often turn to one or the other for relief. Alas in India's case, the legislature remains so detached that engagement on behalf of the military is never an option. This frees the political executive of Parliamentary accountability, and has left the field open for bureaucratic control, patronage and even bullying.

Commenting on Gen. MacChrystal's dismissal by President Obama, Sisodia wrote[15] "It is noteworthy that a mature democracy like the United States, where military intervention has never been a realistic possibility, considers it necessary to engage with the perennial tension of civil military relations. For Americans it is not enough that the question of civilian supremacy has been settled beyond doubt. They feel the need to grapple with the dynamic of civil military relations continuously."

One major step in US civil military relations history was the Goldwater Nichols Department of Defence Reorganization Act of 1986, which made the most sweeping changes to the United States Department of Defence since the department was established with the National Security Act of 1947 along with the later Defence Reorganization Act of 1958. This was necessitated as much by the many weaknesses in the command chain, as by the severe interservice rivalries that were corroding the national security domain.

CIVIL-MILITARY RELATIONS IN INDIA-SIGNS OF STRESS

The Armed Forces Special Powers Act is perhaps an apt example to demonstrate how trust between the civil military institutions in India is breaking down. The Act promulgated by Parliament in 1958 grants special powers to the armed forces in "disturbed areas". The Act has drawn

criticism about being misused and in 2004 the Government set up the Jeevan Reddy Commission, which recommended either amending some provisions, or to replace it by a more humane act. In 2006, the Prime Minister declared that amendments would be made to make it humane, but no further action followed.

Both in 2004 when Manorama Devi was killed in Manipur resulting in protests and more regularly in J&K, an impression has been created that whilst the political leadership would like to do away with the Act, it is the Army that opposes this move. Whilst in isolation this statement may be true, the devil lies in the detail, which is that it is the political executive that declares an area "disturbed" without which provisions of AFPSA cannot be invoked. Further, even when an area is declared "disturbed" the authority vests with the civil administration to call for the army in aid of civil authorities. In spite of these checks and balances, it is not uncommon to see political leaders make public comments implying that the army has a vested interest in retaining AFSPA, whilst the MOD makes no effort to speak up in support of the army. It is difficult not to draw the inference that it suits the political leadership to let this ambiguity remain purely for short term political reasons, even at the cost of long term damage to civil military relations.

A similar situation relates to the Siachin Glacier where enough public noise has been made, indicating that even as the government would like to arrive at a settlement, it is the army that is not willing. It must hurt the pride of our army, when they hear these sentiments voiced not only by many peaceniks in India, but regularly by Pakistani commentators on our news channels. It does the morale and "*izzat*" of our army no good. In such a backdrop, when press reports appeared that a Track 2 dialogue had found the Siachin dispute to be doable, there was much consternation amongst a large section of the strategic community including this writer. That the Indian side was led by a retired Air Chief, and not an army one, with many distinguished retired diplomats and senior officials, and that it had been briefed by not just Indian officials but the military as well, conveyed a clear impression that a Track 2 route was being used by the government as a proxy to put pressure on the army. In spite of much criticism on this score, no clarifications have been forthcoming on whether this Track 2 was a private initiative, or one with the tacit support of the Government!

Whatever the merits of the still raging episode involving Gen. V.K. Singh, a few conclusions are inevitable. That promotions to high levels

in the armed forces are being manipulated, that there is now factionalism amongst the senior levels in the army, and that corruption may have also coopted some in the military service headquarters procurement system. Handling the entire episode with kid gloves, rather than facing up to the truth has perhaps done deep damage to the institution of the army. We are perhaps seeing the history of 1962 repeat itself, albeit hugely magnified.

Present Status and the Structural Fault lines

If in spite of our very weak foundations of civil military relations, the Indian military has seen the nation through five wars, uninterrupted counter insurgency operations in the north east, the IPKF misadventure in Sri Lanka and the proxy war in J&K, not to mention the innumerable occasions it has aided civil authorities. Throughout it has demonstrated, through tremendous sacrifices and by unquestioned subordination to the political leadership, the best in democratic traditions for which it deserves credit and respect. As our democracy has matured, these credentials should have been more than adequate for the democratic institutions to attempt to integrate it more intimately within themselves. Instead, the political executive and the bureaucracy, who are beneficiaries of the existing unequal relationship, have taken this to mean that the screws can further be tightened to keep the military in its place. Surprisingly in a vibrant democracy, Parliament and Legislators who represent the people have failed to fathom this unequal civil military relationship, and its adverse potential and failed to restore the balance. We are now approaching a precipice.

What the present stand off shows is that there is a deep chasm between the political leadership and bureaucracy on the one hand, and the military on the other with Parliament showing no more than peripheral interest. Today, the political leadership lays down a broad directive and then lets the military leadership handle operational matters, with the bureaucracy exercising day-to-day control of the military. India is the only democracy where the armed forces headquarters are outside of the MOD. The damage that this model does to national security can be judged by the fact that even in matters of procurement or senior appointments, the MOD has the last word although it is not accountable for the operational consequences of such unfettered authority. That it is manned entirely by generalists with no military representatives alongside, and is not professionally equipped

to exercise this authority, seems of no concern to our security managers. With a bureaucratic sleight of hand, when the clamour to integrate the MOD and armed forces headquarters became loud after the Kargil Review Committee, the MOD redesignated the service HQ as "Integrated HQ" as against the earlier "Attached Offices". In actual fact, nothing except the letterheads changed! The fact that the two operate separate files on the same issue bares the truth of this facile integration.

The situation in India is aptly described by Anit Mukherjee in his article titled "*Absent Dialogue*".[16] Outlining three characteristics of civil military relationship, he lists the first as strong administrative, procedural and bureaucratic controls over the armed forces, focusing more on the process of decision making rather than outcomes, borne out of the fact that there is no expertise in defence affairs amongst the generalist bureaucracy. This lack of domain knowledge, also prevents the bureaucracy from effective arbitration between competing service interests.

The second characteristic of civil military relations is an exclusion of the military from crucial decision making forums, thus denying it a role in the policy making process. A subject that has been debated *ad nauseam* from the Kargil Review Committee onwards, but with little change. And finally, flowing out of the above two, the military is left very much to do its own thing in the sphere of training, operations, threat assessments, force structures and even appointments up to a certain level. According to Anit, the structure of civil military relations loosely translates into a system where, according to noted strategic thinker K. Subrahmanyam, "politicians enjoy power without any responsibility, bureaucrats wield power without any accountability, and the military assumes responsibility without any direction."

At the military level, these aspects of the civil military relationship are resulting in inter service turf wars with no possibility of professional arbitration, gross duplication in roles and missions, resulting in waste of scarce resources, and finally coming in the way of the military working towards integrated warfare. These have serious operational consequences.

It is worth adding that in the present structure, the most vital institution of democracy, Parliament is missing hence depriving our democracy of participation by the voters, legislators and the political leaderships in an area of governance where the very survival of the nation is at stake. Some would argue that the institution of a Parliamentary Consultative Committee on Defence exists for precisely this purpose and Parliament remains a forum for debate. Experience, however, tells us that

reports of the Consultative Committee are advisory, and it is up to the executive to take whatever action is convenient. In short, the all-powerful bureaucracy does what it thinks is best. Parliament itself rarely indulges in a serious debate on national security or strategic issues and debates on defence budgets are perfunctory to say the least.

According to Shukla,[17] "these structural stovepipes that India operates in, these layered hierarchies – the Services, the civil bureaucracy in the Ministry of Defence (MOD), inter-ministerial bureaucracies like the Committee of Secretaries and apex structures like the Prime Minister's Office (PMO) and the National Security Council, each operating mostly like sanctum-sanctorums with the political class as detached overseers, only perpetuate the perception and the reality of the civil military divide."

The Challenges

The natural question that follows is: why is Indian democracy blind to this reality, more so since the security challenges facing this country on our frontiers and within are far more complex? One can only guess that the ignorance that pervades the political executive both in matters of national security strategy and the higher direction of war makes them comfortable with the status quo. That Parliament is least interested in oversight and ensuring accountability only makes matters easier for the political executive. The bureaucracy, though equally uninformed, enjoys unfettered authority and power over the military without in any way being accountable. Voluntarily shedding such power will need moral standing of a high order.

The military themselves are not entirely blameless. Each service views this vacuum as an opportunity to expand its turf, grab as great a share of the cake, and in times of crises point a finger at the MOD. A classic case is one of perennial turf wars on roles and missions resulting in gross duplication and waste of scarce resources. Jointmanship often touted as an objective is absent, when it comes to planning and fighting an integrated battle. Control by the bureaucracy also means that corruption and promotion-seeking amongst senior ranks is now increasingly evident, and the Chetwode credo of "one's own ease comfort and safety coming last always and every time" is now in serious danger of becoming a mere slogan rather than an act of faith.

What about civil society? "A society that reacts indifferently to the

dishonouring of its armed forces not only risks losing the respect of its armed forces, but demonstrates that the so-called spirit of mutual trust and sacred contract of unlimited liability have become one-sided to the detriment of the armed forces. In today's connected world, the armed forces are not insensitive to this state of affairs. This augurs ill for the morale of the armed forces of India. The moral question that society must ask of itself is: what are its obligations to its armed forces professionals, its veterans, martyr's widows and those wounded and maimed for life, in return for their unlimited liability? The larger question is: why is Parliament, which is the voice of the people, not performing its moral duty towards society, the government that it selects and the armed forces, in enforcing moral and ethical accountability?"[18]

This is the status quo today, and there appears neither any urgency nor desire to alter it. Not surprisingly, it was the Kargil Review Committee Chaired by the late K. Subrahmanyam that had stated the committee was of the view that the "political, bureaucratic, military and intelligence establishments appear to have developed a vested interest in the status quo".

It is this status quo that needs to be altered if civil-military relations are to be brought onto an even keel and events of recent times prevented from ever happening again. This is a tall order. The institution of the military is a living organism, it heals its wounds although it remembers the scars, it evolves with changing dynamics, but at its heart, it continues to believe that its commitment of unlimited liability to the nation is the only honourable thing to do. It is the sacred duty of every civil institution from the people, their elected representatives, the Parliament, the political executive and the bureaucracy to be cautioned that the day this institution begins to have second thoughts on the fairness of the cause of its unlimited liability, the nation's survival itself will be in jeopardy. True civil military relations are about rebuilding and balancing this trust, under the over arching umbrella of political control over the military.

The Way Ahead

There is, however, a silver lining. There is far greater interest visible in the public domain on matters of national security and concerning the armed forces. Pushed by a vibrant media, not just security policies of the government, but any perceived problems within the armed forces

are now being openly debated and answers being sought. More think tanks are devoting energies towards national security issues. Belatedly, the foundation of a National Defence University have been laid, and in the fullness of time its scholars will contribute to greater knowledge and awareness on issues discussed earlier. In essence, national security is no more being treated as a holy cow, questioning of which was considered unpatriotic, and which could be kept from public gaze under the veil of secrecy. This awakening is good for Indian democracy and augurs well for national security.

Even as India progresses legitimately aspiring to great power status, there is little doubt that it faces complex external and internal security challenges. Indian democracy meanwhile is firmly established with strong roots. This should give us the confidence to relook at the entire edifice of national security, which essentially derives from the inheritance of the colonial era and has evolved only incrementally. There is need to study and understand the overall security dynamics facing the country and the appropriate models that will best suit our national security needs while strengthening our model of democracy.

For far too long have we played the charade of forming committees and task forces consisting of the very people who have been brought up within this system, and who have been conditioned by its frailties and prejudices. The way forward is to set up a Blue Ribbon Panel that is tasked to look at the entire issue of civil-military relationships, organizational models, coordination with other departments and agencies of the government concerned with national security, and to come up with a blueprint for a potential National Defence Act for the nation and Parliament to debate and adopt. The Blue Ribbon label signifies that the panel consist of the best and brightest for the task and be outsiders, thereby bringing in a fresh approach to the management of national security for a democratic India that aspires to great power status.

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AIR **M**ARSHAL **(R**ETD**) B**RIJESH **D**HAR **J**AYAL **PVSM, AVSM, VM & Bar**

Joined the NDA in 1952. Commissioned as a fighter pilot in the IAF in 1955. Graduated as an experimental test pilot in 1965 from ETPS Farnborough. Operational career includes command of a Mig 21 squadron and a Jaguar base and flight-testing both with the IAF test establishment and HAL. A graduate of NDC. Staff appointments in Air HQ as Director Air Staff Requirement, ACAS (Plans), ACAS (Operations) and Deputy Chief of Air Staff. Commanded Eastern and South Western Air Commands. Retired in 1993. Post retirement was member

of the committee on setting up of the Indian NDU, has served on the Board of Governors of the Doon School and Welham Girls School. Writes on national security issues in national papers and professional journals and is presently Honorary Chairman Raphael – Ryder Cheshire International Centre for Relief of Suffering.

Lessons Learnt and Unlearnt from the 26/11 Mumbai Attack

Shri Gopal K. Pillai

The 26/11 terrorist attack in Mumbai was an eye-opener for the entire interior security establishment of India. It resulted not only in the resignations of the Union Home Minister and the Home Minister of Maharashtra, but also exposed the hollow edifice of all the anti-terrorist plans, and cast India in a very poor light in so far as our response to a terrorist attack was considered. For almost 68 hours, the world watched as a handful of terrorists held the entire country to ridicule.

The only saving grace was that the casualties were not higher and the capture alive of one of the terrorists gave India a huge psychological dividend, and fully exposed the involvement of the State of Pakistan and so called non state actors in this dastardly act. So much so that, Pakistan did not even have the courtesy of acknowledging the involvement of its citizens, resulting in the families of the terrorists being unable even to claim the bodies and bury them in their country.

The key facts that emerged were that the terrorists, trained by the Lashkar-e-Taiba (LeT) and the ISI were able to hijack an Indian fishing boat, evade surveillance by the Indian Navy and Coast Guard and land undetected off the coast of Mumbai. The terrorists were able to then proceed to their various targets, including a railway station, the Leopold Cafe, the Chabad House, the iconic Taj hotel, the Oberoi and Trident hotels, causing death and mayhem for almost three days before all the terrorists inside the building were killed with the sole exception of Ajmal Kasab. Incidentally, he too was captured not in the Taj but on the streets, when intercepted by the Mumbai police. His subsequent confession, the

recovery of the hijacked boat with evidence therein, and his subsequent trial and conviction are very well documented and I do not intend repeating the gory details.

The main lessons learnt were:

1. That we lacked mechanisms to comprehensively analyse available sketchy or incomplete and ad hoc intelligence reports and take them to their logical conclusion.
2. The response of the State Police was confused, lacked leadership, and violated all standard protocols.
3. The initial response of the Ministry of Home Affairs was tardy, delayed and confused.
4. The handling of the media during the operation to rescue trapped civilians and hostages was completely unprofessional, and endangered more lives and delayed the culmination of the action.
5. Lack of knowledge of the layout of the hotels and absence of a clear strategy by the NSG delayed early elimination of the terrorists holed up inside the hotels.
6. Essential equipment required for giving the NSG an edge in operations inside closed environs like the Taj and Chabad House buildings were not available.
7. Coastal security was quite inadequate to deal with sea borne terrorist attacks and needed complete overhaul.
8. The basic policing and standard operating procedures were totally inadequate and needed overhaul.
9. State police forces needed to be trained and strengthened to be the first responders in the event of a terrorist attack.
10. Intelligence agencies were woefully inadequate in terms of manpower, requisite skills and technology to meet such emerging threats.

As a result of these tentative conclusions, following a review undertaken post-haste the 26/11 attack, and public clamour to strengthen the response to any further attack by terrorists in India, the following steps were taken:

(a) A multi agency centre was set up in the Intelligence Bureau, in which all intelligence agencies representatives would meet daily and share and evaluate evidence received before submitting the same to the Ministry of Home affairs.

(b) The Union Home Minister began to hold daily meetings with the NSA, the Union Home Secretary, Secretary (R&AW), Director IB and the Chairman JIC, where the latest intelligence inputs would be discussed and follow up action decided.

(c) Additional manpower for the IB was sanctioned and recruitment initiated in a phased manner.

(d) Additional training institutions for the IB were also sanctioned to cater to the requirements of increased manpower.

(e) A Coastal Command was setup to boost coastal security under the Indian Navy; new vessels were purchased for the Coast Guard and for the state marine police.

(f) In addition, new marine postal stations were also set up, so that in liaison and in partnership with the local fishermen community, these would act as eyes and ears of the coastal security set up.

(g) State police forces were modernized with new equipment, new training and counter insurgency schools sanctioned, quick reaction teams and commando forces raised, new SOP's drawn up to deal with terrorist attacks and media management during such attacks, etc.

(h) Regional hubs of the NSG were established to enable faster and more knowledgeable response, and more sophisticated equipment purchased to give NSG commandos an edge in operating in closed buildings and hostage situations.

(i) NIA was established to investigate terrorist incidents and terrorist financing and has established its credibility with the states.

(j) Protocols for a transparent, fair and merit based recruitment to the constabulary have been laid down, but implementation is still patchy.

All these steps, as well as action taken to establish the CCTNS, NATGRID (still work in progress) means that we are in a slightly better position than we were when the 26/11 attacks took place. But the following areas of concern still remain:

1. The political class especially at the state level still does not allow police forces to be an independent professional force. The police force in their eyes is still an agency to further their political ends. Till this mindset changes, the police force will remain confused, will lack leadership and will fail to respond as a professional force.

2. The fact that 25 percent of the sanctioned strength of state police

forces remains vacant, is a telling comment on the low priority accorded for improving the police functioning and for providing basic security to the citizens. We have a short memory and 26/11 is almost forgotten.

3. Both the CCTNS and NATGRID have been delayed by over two years and face serious problems. The NCTC is in cold storage and awaiting another major terrorist attack to be taken out of cold storage and activated.

4. Marine police stations are still not accepted as a professional force and their organic linkage with the rest of the state police force needs attention. Perhaps, a separate cadre of marine police needs to be established to give a thrust to coastal security. The maintenance of the patrol and interceptor boats needs attention.

5. Not enough mock drills are carried out to test the preparedness of the new commando forces, QRTs and other state police forces. We are still short of adequate police forces and the total shortfall is estimated to be over 10 lakhs.

In conclusion, if I were to be asked to frankly assess the preparedness of the state and central forces to face a 26/11 type attack, or perhaps something quite different, which is more likely the case; then on a scale of 1 to 100, I would say that we are only at about 40 and that is a frightening thought.

SHRI GOPAL KRISHNA PILLAI

Shri Gopal Krishna Pillai was a former Union Home Secretary, Government of India.

He belongs to the 1972 batch of the IAS and initially worked in the State of Kerala as District Collector, Quilon, Special Secretary for Industries, Secretary for Health and as Principal Secretary to then Chief Minister, Shri A.K. Antony.

In the Central Government, he has in the Ministries of Defence, Transport, and Shipping. He worked in the Ministry of Commerce as Additional Secretary, Special Secretary and Secretary Commerce during 2004-2009. In the Ministry of Home affairs he was Joint Secretary (North-East) during 1996-2001 and Union Home Secretary prior to his retirement in 2011.

Post retirement, he chairs a Venture Capital Fund and was recently appointed as Chairman of MCX-SX, India's Third Stock Exchange. He is also a member of the National Security Advisory Board, and a Distinguished Fellow, IDSA.

The Arab Spring
Political Competitions in West Asia

Amb. Talmiz Ahmad

The Arab Spring commenced with the fall of four Arab dictators almost entirely as a result of popular upsurges demanding political change. The roots of the Arab malaise lay in the restoration of colonial authority through the League of Nations "mandates", which were enshrined in the agreements among western powers after the First World War. Contrary to assurances of freedom given to Arab leaders to encourage their participation in the liberation war against the Ottoman Empire, the Levant was systematically divided into five countries and placed under British and French control. David Fromkin has correctly traced present-day problems across the region to this original sin:

> The Middle East became what it is today both because the European powers undertook to re-shape it.... During and after the First World War, Britain and her Allies destroyed the old order in the region irrevocably; they smashed Turkish rule of the Arabic-speaking Middle East beyond repair. To take its place, they created countries, nominated rulers, delineated frontiers, and introduced a state system of the sort that exists everywhere else; but they did not quell all significant local opposition to those decisions.
>
> The settlement of 1922, therefore, does not belong entirely or even mostly to the past; it is at the very heart of current wars, conflicts, and politics in the Middle East....[1]

Even after the mandates came to an end, the Arab world remained under western influence which was exercised through control over the ruling regimes and, when necessary, through military intervention.

Under western hegemony before and after the Second World War, the Arab world entirely missed the opportunity to establish a democratic order that commenced with Indian independence in 1947 and, in the following decades had slowly embraced all of Asia. From the early 1990s, Latin America too threw off its dictatorial regimes that had been in thrall to US interests, while in Africa the emergence of the "rainbow nation" of South Africa led the way for a nascent democratic order across the continent. Amidst these significant political developments, the Arab world, stretching from Morocco in the west to Yemen in the east, appeared to be entirely immune to political reform. Every country was ruled by authoritarian leaders, some of them traditional monarchs, while others were despots who had overthrown monarchies and established their rule through coups d'états. Almost all these leaders sub-served western interests, usually represented by the United States, and maintained a domestic order that curbed all personal freedoms, even as it rewarded coteries around the rulers with senior government positions and economic benefits.

This domestic political malaise was further aggravated by the setting up of the state of Israel in Arab territories, and the defeat of the Arab armed forces in 1948 and 1967, which further contributed to the pervasive sense of defeat and despair among the Arab people who were emphatically reminded that they were not masters of their own destiny.

The political scenario did not improve with the oil boom of the 1970s that brought huge revenues to the oil producers, principally the Gulf monarchies. While the desert Sheikhdoms across the Arabian Peninsula reaped an extraordinary bonanza through national development and modernization of infrastructure and welfare facilities, the same financial resources also enabled the rulers to maintain the political status quo, usually by co-opting different sections of the populace into the politico-economic order controlled by them. However, the economic advantages enjoyed by the Gulf Sheikhdoms and a few republican oil producers in Iraq and North Africa did not have any positive impact on the non-oil Arab republics and monarchies. Here the economic order was characterized by increasing unemployment and poverty, set off against small islands of privilege and wanton corruption.

The Arab Spring was heralded in Tunisia in this background, in December 2010, when popular insurrection over four weeks led to the abdication of President Zine El-Abedin Ben Ali, who fled with his coterie after having ruled Tunisia for 25 years. This extraordinary consequence of popular dissent had immediate reverberations across the Arab world,

and for two months, up to March 2011, there was in the region a sense of unbridled joy and anticipation of infinite possibilities, particularly after the fall of the Egyptian potentate Hosni Mubarak in February 2011. A Saudi journalist captured the sense of pervasive euphoria thus:

> What is happening in Egypt is a historical transformation which has not been witnessed by the Arab world in its modern history. What the demonstrations of the youth are demanding is no less than a complete break with the current era at all political, economic and social levels. *We, nowadays, are witnessing a radical transformation in the history and geography of the Arab world...,* hence the Arab world, after these days, will not be as it was previously. (Emphasis added)[2]

The Present Scenario

Now, nearly three years later, four countries are in the throes of major political change: following the fall of their dictators, Tunisia and Egypt had their first free elections which led to the triumph of Islamist parties, the Muslim Brotherhood-affiliated Freedom and Justice Party in Egypt and the al-Nahda in Tunisia. However, in both countries, the Islamist parties quickly revealed their lack of experience in governance and their inability to bring different sections of the populace together into a composite nation. The deep polarizations in Egypt provided an opportunity for the armed forces to carry out a coup d'état to unseat the Brotherhood government and seize power which it had enjoyed in the country since the revolution of 1952.

The Al Nahda in Tunisia has been more astute in that it has agreed to voluntarily step down from power and provide an opportunity for non-Islamist elements to participate in government to promote national unity, though the actual implementation of this road map for change remains mired in differences among the contending political groups. In Yemen, President Ali Abdullah Saleh reluctantly abdicated in November 2011 and opened the way for his deputy, Vice President Abdo Rabbo Mansour Hadi, to take his place, a change that was facilitated by the GCC countries. However, the government remains largely ineffective in the face of deep party political divides, the Houthi uprising in the north, the separatist movement in the south and the expanding role of radical Islamic elements.

Unlike other countries, the Libya regime change was effected not through a popular uprising but through direct Western military intervention that destroyed the infrastructure and capabilities of the

Gaddafi regime, and opened the door to various warlords and their armed militia who now control different parts of the country. The government in Tripoli that was formed after elections is non-Islamist, but enjoys hardly any effective authority, with the country crippled by warring militia.

In the Gulf Sheikhdoms, a different drama has taken place. In Oman, there were public demonstrations criticizing the government for corruption and rampant unemployment, with some destruction of property and police firings. However, Sultan Qaboos moved swiftly to address these grievances: the council of ministers was thoroughly revamped, generous doles were provided for the unemployed and employment-generation schemes were promulgated. In Bahrain, there was a popular uprising similar to that which had taken place at Tahrir Square in Cairo, with large sections of local citizens congregating at the Pearl Square to press for reforms. The government, led by the Bahraini crown prince, engaged in dialogue with the leaders of the agitating groups, and there were even indications in early March 2011 that an agreement would pave the way for significant political reform and possibly a constitutional monarchy. All such expectations came to an abrupt end when Saudi and other GCC armed forces personnel entered Bahrain on 14 March 2011; Bahraini security forces then dispersed the Pearl Square agitators and, a few days later, the government went ahead and destroyed the iconic monument at the square.

Clearly, Saudi Arabia, which till then had watched with considerable dismay the political changes effected by the Arab Spring, firmly drew a red-line in Bahrain. Its principal concern was that political reform in Bahrain would have powerful resonance across other GCC countries. Again, the Kingdom feared that any changes in the country would certainly empower Bahrain's majority Shia community, which would embolden minority Shia communities across the GCC to seek improvement in their own economic and political situations. In the face of what the Kingdom saw as an existential threat to the order presided over by it, Saudi Arabia gave up its quietist and moderate approach in regional affairs, and initiated a direct confrontation against Iran: it blamed Iran for fomenting the agitations in Bahrain and for seeking the achievement of "Persian" hegemony and its own sectarian spread across West Asia. Saudi Arabia's concerns pertaining to Iran originate in the regime change effected by American armed intervention in Iraq in 2003, which brought to power a Shia government in Baghdad. As Riyadh saw it, this change redounded to Iran's strategic advantage, particularly since Iran already enjoyed considerable benefits

from its longstanding alliance with Syria and its patronage of Hezbollah in Lebanon.

This new Saudi activist approach found expression in two arenas: first, in Egypt, Saudi uneasiness with the increasing empowerment of the Muslim Brotherhood encouraged it to back Salafi parties in opposition to the Brotherhood and, later, the military coup engineered by General Abdul Fattah Al Sisi. In the face of Western unhappiness with the coup, Saudi Arabia led other GCC countries in reassuring the military regime with promises of substantial financial support. Later, in November 2013, it also succeeded in persuading the US administration to engage constructively with Egypt's military leaders, so that Secretary of State Kerry publically asserted that the Brotherhood had "stolen" the Arab Spring.

Second, while the Saudi role in Egypt is political and financial and generally behind-the-scenes, its role in Syria is overt and has a distinct military character. In the early days of the Arab Spring, when there were sporadic public agitations for reform in Syria, Saudi Arabia attempted to persuade President Bashar Al-Assad to abandon his engagement with Iran and rejoin the Arab fold. Al-Assad, however, saw little strategic advantage for himself or his country in this turn-around, since he was not promised a return of the Golan Heights occupied by Israel, while the relationship with Iran, on the other hand, enhanced his stature in the region even as it provided the Islamic republic an outreach to the Mediterranean. Syria's ties with Iran also gave it considerable influence over the Hezbollah and, through it, in Lebanon's political affairs.

Bashar Al-Assad's reluctance to abandon the Iran alliance led to significant outside intervention in Syria, with different external role-players supporting various rebel militias against the central authority: Saudi Arabia is backing the Free Syrian Army (FSA) made up of personnel who have deserted the national army, as also diverse Salafi groups. Qatar, in association with Turkey, is backing militia affiliated to the Syrian Muslim Brotherhood. A third force that is active in the Syrian battle-zone is made up of Al Qaeda-affiliated elements who are either home-grown, or have come in from Iraq.

The Syrian battle arena thus consists of several thousand diverse fighters who are battling each other with the same ferocity with which they are confronting national forces.[3] Both sides have participated in wanton destruction and extraordinary cruelty. However, two-and-a-half years after the conflict commenced, external role-players, while able to

sustain the conflict, are unable to achieve military victory. At the same time, there are grave doubts that, even if there were to be a regime change in Damascus, an effective authority would emerge to bring unity and development to this benighted land.

<div align="center">**IMPLICATIONS OF POLITICAL COMPETITIONS**</div>

The Arab Spring has had an impact in several areas whose ramifications will reverberate across the region over the next several years. These are examined in the following paragraphs.

Sectarianism

The principal weapon that Saudi Arabia is wielding in its strategic competition with Iran is that of sectarianism. The country itself is home to about two million Shias, mainly living in the coastal towns of the Eastern Province, which is also the Kingdom's oil production centre, both on-shore and off-shore. However, the Wahhabi tenets to which the royal family and the country are wedded, have hostility for the Shia as an essential part of their doctrinal make-up.

After the Islamic revolution, there had been some public demonstrations in the Eastern Province in support of Iran. In response, King Fahd ended the iron rule of the Jalawi branch of the Al-Saud and made his son, Prince Mohammed bin Fahd, the Governor of the province in 1985, a position he held till January 2013. During his rule, while the Saudi order could not provide religious accommodation to the Shia, an attempt was made to address some of their grievances by modernising their towns, and providing them with educational and welfare facilities, as also opportunities for commercial success. After the events of 9/11, when then Crown Prince Abdullah bin Abdulaziz was projecting a "liberal" approach in the country, petitions were submitted to the ruler by Shia leaders asking for equal opportunities for their community in regard to ministerial, administrative and diplomatic appointments, and the right to practice their own rituals with freedom. Later, after the Arab Spring, there have been several Shia demonstrations in the Eastern Province demanding political reform. In fact, these demands have echoed almost identical demands for reform made by the Kingdom's activist intellectuals on the Sunni side. There are reports that moderates among them are looking for common ground with their Shia counterparts to pursue joint reform proposals.[4]

However, in the context of the confrontation with Iran, the Saudi media has focused on the sectarian divide, indulging in sharp calumny against Iran as also the regimes of Iraq and Syria. Thus, following the bombing of the Iranian embassy in Beirut in November 2013, a Saudi writer, Mashari al-Dhayidi, said the following in the Saudi-owned *Al-Sharq al-Awsat:*

> Iran, together with its party in Lebanon [*Hizbollah*], represents the *Nusra* Front of the mongrel regime in Syria, formed out of sectarian, mafia, and family scum. Iran has employed all the sectarian sentiments it can muster in its service, from the Hazaris in Afghanistan, to the Houthis in Yemen, and all the Shiites it could recruit, of course.[5]

Again, an editorial in the Saudi paper, *Al-Watan*, castigated the Al-Maliki government in Iraq for its sectarian affiliation with Iran:

> For well-known sectarian reasons, the Maliki government has flung the door open to many groups that base their activities on sectarian [Shiite] grounds. This exceptionally sectarian government should bear the consequences of its sectarian nature that has transformed Iraq into a playground for others [i.e. Iran] to pursue their political goals. In fact, it has turned Iraq into an arena where others implement their expansionist schemes based on purely 'ideological' grounds, which in turn are based on exporting a 'confessional' political idea that has brought many disasters and disturbances upon the region.[6]

A Saudi commentator, writing in the Qatari paper, *Al-Arab*, has in fact criticized the Saudi view of all Arab Shia as lackeys of Iran; he said:

> We [the Saudis] have decided that the Arab Shiites are loyal to Iranian influence, and have left them with only two options: either to be total lackeys of Iran, or to be harmed by its policies and open to its pressures, as is happening in Southern Iraq, in particular. … This matter requires a serious and radical review. These people are Arabs before being Shiites. There are elements of their identity that draw them closer to Saudi Arabia than those that push them towards Iran. But, that cannot be achieved unless we change the narrow confessional view of this fundamental constituent in our Arab societies.[7]

This sectarian mindset has led the Saudi leadership to focus on the "Alawi" identity of the Al-Assad family, and stigmatize it as a Shia entity that is beholden to Iran and supportive of its regional ambitions. In the early stages, the Syrian protests had been non-violent, with the leaders

deliberately projecting a multi-ethnic, multi-confessional front. However, in due course, extremists on both sides gave a sectarian orientation to the uprising. Al-Assad now promoted himself as the protector of minorities and his enemies as "Al-Qaeda", while a number of Islamic charities in the GCC countries began to fund extremist Salafi groups in Syria, with their governments doing little to control them.[8] The Kingdom is projecting a similar sectarian hostility to the Hezbollah, particularly after its members joined the Syrian armed forces against rebel onslaughts.

The sectarian divide has now acquired a central position in the region's competitions, amidst indications that its baneful impact will be felt over the next few decades, unless corrective action is taken by the principal role-players. The likelihood of that seems remote at this point.

Islamist Parties

In its early period, the Arab Spring provided an opportunity for the region's Islamist elements to assert their role in the emerging democratic political order. The Muslim Brotherhood was set up in Egypt in 1928 and through most of the last century it had been at war with the established political authority in Cairo, first the monarchy and later, from 1952, successive military dictators. During this period, while its leaders faced execution, incarceration and exile, the Brotherhood did establish a strong presence at the grassroots level across the country through its social welfare activities; in urban areas, it was successful in dominating the educational and professional syndicates. From the 1980s, the Brotherhood also attempted to modernize its political platform by accommodating democratic principles and the rights of minorities and women in its agenda. However, the movement continued to be dominated by rigid and doctrinaire leaders, with liberals having little space in the top leadership. The movement also had a long tradition of clandestine militant activity which had been a powerful tool against political tyranny, but whose negative influence continued even after the Arab Spring.

The popular upsurge against Hosni Mubarak's rule in different cities of Egypt in early 2011 caught the Brotherhood by surprise, and for some time it hesitated about its role in this uprising. When it decided to join the movement, it brought to the popular agitation a large and a highly disciplined and motivated cadre of activists, who in time took over the movement for political reform and later, through electoral successes, the national assembly and the presidency. However, nothing in the Brotherhood's experience had prepared it for the challenge of governance:

Morsi's government for much of its life was seen as ineffective and incompetent, and it alienated large sections with its doctrinaire approach. All through Morsi's rule, there was a powerful cacophony of criticism, largely emerging from elements affiliated with the *äncien regime* and non-Islamist forces. Given that in the first round of the presidential election, Morsi had received a little over a quarter of the vote and in the run-off had just obtained a simple majority against a candidate affiliated with the Mubarak regime, it was not difficult for the armed forces to unite the anti-Morsi elements which included youth, women, minorities, liberals and even Salafis, under their leadership and effect a coup.

The ouster of the Morsi government was particularly important for Saudi Arabia, which has had a long and rather uneasy relationship with the Brotherhood since the 1950s. Contrary to the tenets of Wahhabiya that give legitimacy to the rule of the Al-Saud, the Brotherhood espouses a rival political doctrine that, while anchored in Islam, supports modern political ideas and institutions such as political parties and platforms, free elections, constitutionalism, freely elected national assemblies, independent judiciary and freedom of speech, all of which are anathema to the Saudi political order. A more important reason for the Saudi concern about the ascendancy of the Brotherhood in Arab politics is the impact the Brotherhood has had on Saudi Arabia's own Wahhabi establishment in the shape of the *Sahwa* movement [movement of activist intellectuals], which shares political views and the agenda of the Brotherhood while maintaining its base in Islam.[9] The same motivation has encouraged Saudi Arabia to oppose the increasing role of the Brotherhood in Syria.

As of now, Islamist groups are under severe pressure: underground in Egypt; beleaguered in Tunisia; on trial in the UAE, and systematically marginalized in other Arab countries. However, given that the vast majority of the Arab population would like to see some degree of Islamic influence in national legislation and institutions, the Islamists are likely to remain significant in the political domain. A positive outcome of their present ostracism would be the opportunity available to them to reflect on their mistakes so that they can re-emerge in the political order and play a more effective role in national democratic politics.

GCC Affairs

While the GCC countries have projected themselves as being immune from the storms of the Arab Spring, certain observers have noted the fragilities in their order and believe it is not sustainable. Christopher

Davidson, the well-known authority on GCC politics, has pointed out that the GCC regimes have sought to maintain their security on the basis of an alliance with Western countries led by the US, providing the latter with military bases and sweetening ties with high-value defence contracts for weaponry that is unlikely to be used in combat. He accuses the GCC leaders of using the bogey of Iran and encouraging sectarian tensions to divert attention from increasing domestic socio-economic pressures, policies that have even led them to be dovish with Israel, which could in time, alienate them from sections of their own population. In fact, the domestic situation could get further complicated for incumbent monarchs due to power struggles within the various royal families.[10]

Arab commentators, too, have become increasingly vocal in criticizing the GCC, particularly the Saudi role in the regional scenario. A Saudi writer, Ali al-Dhafiri, has pointed out that Saudi Arabia is steadily losing influence in different parts of West Asia in the face of aggressive, well-calculated and well-coordinated Iranian political and diplomatic initiatives. Iran has been particularly effective in Yemen, where it has set up a militia called *Ansarullah* (on the lines of Hezbollah in Lebanon) among the Houthi rebels, and has also linked up with southern secessionists led by the former leader of South Yemen, Ali Salem al-Beedh, thus posing a serious challenge to GCC security. He criticizes the Kingdom for its affiliation with "old decrepit regimes", as also preventing the political evolution of different Arab countries; in this regard, he says:

> We [the Saudis] cannot proceed on the basis of keeping other Arab societies within the confines of what we want. These peoples have their own aspirations for democracy and political reform in their respective countries. We cannot make our own survival to be contingent on rejecting these aspirations and working against them.[11]

On the same lines, the pan-Arab liberal paper, *Al-Quds al-Arabi*, in an editorial has severely criticized Saudi Arabia for its "revival, reactivation and resurgence" of the Shia-Sunni divide, and contrasts Saudi feebleness with Iran thus:

> The chronic geriatric nature of Saudi rulers and the corruption and decrepit nature of its foreign policy machine have left the Kingdom unable to match Iran's political vitality. To this should be added the political and strategic mistakes that have exacerbated Saudi fragility, weakened the Kingdom's friends, and strengthened its enemies.[12]

The well-known Arab commentator, Tarek Osman, in an article titled "*The Saudi Spring?*", speaks of the "deterioration" in Saudi Arabia's political influence, which has in turn contributed to "a growing sense of (its) national decline". He notes Saudi intolerance of other "innovative forms of political Islam" which provide a platform for genuine popular representation but which the Kingdom sees as a "strategic threat". Above all, he points to the "gradual erosion" of its wealth due to decreasing oil exports, poor education system and the lack of competitiveness of its economic sector. He fears the country could sink into irreversible decay, with attendant sectarian conflicts and territorial fragmentation. A more positive alternative scenario, he contends, would require constitutional monarchy, checks-and-balances and representative governance.[13]

At the same time, amidst the challenges posed by the Arab Spring, the GCC itself has not exhibited political, military or even doctrinal unity. Saudi activism in the ouster of the Brotherhood government in Egypt, and its confrontations against Iran across different theatres in West Asia have been actively supported by just two countries, Bahrain and the UAE. Bahrain obviously shares Saudi concerns pertaining to Iran's "interference" in Gulf affairs, while the UAE itself fears Brotherhood influence among its citizens, some of whom have been arrested and sentenced for their membership of the Brotherhood-affiliated Al Islah party which calls for extensive political reforms in the country.

Kuwait during this period has been coping with its own recurring political crises, with the leitmotif of free elections and dissolution of national assemblies that emerge from these elections. Oman on its part has maintained its quietist tradition and has avoided any overt criticisms of Iran. In fact, its ruler, Sultan Qaboos, engaged in quiet but significant regional diplomacy when he visited Tehran in August 2013, facilitating the recent thaw in US-Iran ties.

Through most of the period of the Arab Spring, Qatar has pursued a role that has been entirely at variance with that of Saudi Arabia: it had actively supported the Brotherhood government in Egypt as also the Brotherhood forces in Syria. Qatar's activism in regional affairs was brought to an abrupt end when the Amir of Qatar abdicated in June 2013, and exited from the political scene along with his high-profile prime minister. The former Amir's son, Sheikh Tamim, who took over as Amir, has been relatively low-key in regional affairs and there are reports that Qatar has ceded the principal role in Syria to Saudi Arabia.

Even before the US-Iran thaw, Saudi Arabia had every reason to be dissatisfied with the US's West Asian policy: it had allowed Hosni Mubarak to be deposed; it had attempted to do business with the Morsi government, and later had been lukewarm about the Al Sisi coup; and, finally it had failed to carry out a military assault upon Syria even when the regime had crossed the "red-line" and used chemical weapons against its own people. Saudi Arabia conveyed its unhappiness to the Americans by refusing to speak at the UN General Assembly, and later refusing to take the Security Council's seat it had won after so much effort, all signs of an uncharacteristic petulance. For the Saudis, the US-Iran engagement is the last unacceptable straw. Now, with the US reaching out directly to Iran, pursuing a consensus on the nuclear issue, and accommodation on other regional matters that have divided them for 30 years, Saudi Arabia and its associates appear to be increasingly isolated in the regional and global flow of events.

Thus, while Oman remains quiescent and Qatar aloof, Saudi Arabia leads the GCC in its confrontation with Iran, in the battlefields of Syria, in its support of the military coup in Egypt, in a strategic camaraderie with Israel and, above all in espousing the sectarian divide in the Muslim community, all attempts at keeping at bay the contagion of the Arab Spring.

Regional Role-Players

Amidst the fierce intra-Arab contentions taking place in different parts of the region, particularly in Syria, Egypt, Libya and Lebanon, three important non-Arab countries have staked their interests in these competitions. Israel, of course, sees an existential threat in Iran's nuclear programme and a more immediate threat from Hezbollah, Iran's protégé on its borders with Lebanon. Hence, it has deep interest in the ongoing conflict in Syria and has begun to see considerable merit in regime change which would de-link Damascus from Tehran. To this end, Israel has directly entered into the Syrian conflict by carrying out air attacks in January and October 2013, ostensibly to destroy weapons bound for Hezbollah. Israel has also developed a commonality of interests with Saudi Arabia in so far as the threat from Iran is concerned, supporting Saudi lobbying efforts in Washington in favour of a US led military assault upon Syria. In recent weeks, Israel has publicly shared Saudi concerns regarding the US-Iran détente, warning the Americans that Rouhani is a "wolf in sheep's clothing".

Turkey, under Prime Minister Erdogan, has been taking considerable interest in West Asian developments, particularly after the public spat between President Shimon Peres and Erdogan at Davos in January 2009. In line with his party's Islamist credentials, Erdogan was supportive of the Brotherhood government in Egypt, and sharply criticized the Al Sisi coup, which served to distance Turkey from the anti-Brotherhood alliance structured by Saudi Arabia in Egypt and later in Syria. Turkey, on the other hand has been working closely with Qatar in supporting the Brotherhood militia in Syria, a role it continues to play even though Qatar's own position has become more muted.[14]

Turkey, of course has deep interest in the steady progress in the Kurdish search for self-government in the region. In this regard, it has taken a series of well-coordinated actions:

(a) it has neutralized the PKK leadership at home, while pursuing a more accommodative policy with regard to its own Kurdish community;

(b) it has reached out to the leaders of the autonomous Kurdish region in Iraq and has encouraged the region's drive towards economic independence by supporting the Kurdish link to the Kirkuk-Ceyhan pipeline and promoting a separate direct pipeline from Kurdistan to Turkey; and

(c) it has strongly opposed the decision of Syria's Kurdish population to set up an independent enclave on the Iraq border.[15]

Of course, the most important non-Arab role-player in the regional scenario is Iran: all present-day discords emerge from the Saudi-Iranian strategic competition for power and influence, with Saudi Arabia painting Iran's ambitions in ethnic and sectarian terms.

However, the consensus among regional commentators is that Iran has been the successful party in these confrontations: it has stood by the Al-Assad regime and, with Russia's help, has defused the clamour for regime change from the GCC and strengthened the possibility of a political resolution at an international conference. Again, it is Saudi Arabia that is seen playing the sectarian card and cosying up to Israel, for which it is being criticized by GCC and other Arab commentators. Further, Turkey, which had been estranged from Iran on the Syrian question, is now reaching out to Iran to address their shared concerns about rising sectarianism and to work together to bring peace in Syria.[16] At the same time, in spite of Saudi tantrums, the US, Saudi Arabia's principal strategic

and security partner, continues to pursue the détente with Iran, with every possibility of consensus being achieved in time on major regional and global issues.

Al Qaeda and its Affiliates

Though Al Qaeda's central leadership on the Pak-Afghan border has been severely wounded by the US's assassination of Osama bin Laden and continued drone attacks on its allies in Pakistan and Afghanistan, in terms of its own interests, the regional scenario seems to be evolving satisfactorily. First, its cadres have been able to penetrate various territories where central authority is weak or has collapsed, such as Yemen, Somalia, Syria, Libya, and parts of northwest Africa centred around Mali and Northern Nigeria. In all these areas, it has been able to wreak murder and mayhem and from time to time "liberate" certain pieces of territory where the harsh *hudood* punishments have been enforced. Second, the political failure of the mainstream Islamist movement, it believes, has rebounded to its advantage, since it had always maintained that participation in party politics would never yield positive results for Muslim groups. Third, the deepening sectarian divide is in tune with Al Qaeda's anti-Shia mindset. Finally, it believes that the situation in Syria is developing to its advantage; its own cadres, represented by the Islamic State of Iraq and Syria (ISIS) and the home-grown Jabhat Al-Nusra, seem to be coordinating more effectively with each other, fighting well on the ground and liberating increasing pieces of territory.

There is little doubt that extremist Islam, represented by Al Qaeda and its affiliates, will remain a potent force in the Arab region in years to come. Separately, between the mainstream Brotherhood and Al-Nahda and the more extreme Al-Qaeda, a number of radical Salafi groups have emerged, which, with GCC support, are active in Syria; they are also present in other parts of West Asia and North Africa, particularly in Lebanon, Egypt, Libya and Tunisia. There is only a fine line that divides these groups from Al-Qaeda. Hence, we could be looking at radical movements outside Al-Qaeda that would compete with the mainstream Islamists for influence in different countries in the region.

PROGNOSIS

On the face of it, the West Asian scenario seems to be quite grim and very distant from the joyous aspirations for freedom, democracy and

dignity that had characterised the early days of the Arab Spring three years ago. The pattern of developments pertaining to the Arab Spring is generally in line with similar attempts at revolutionary change in other countries in the past: in their early stages, such attempts are not well-organized, while the forces seeking the preservation of the status quo have at their disposal all the organisational and coercive powers of the state. While in government, in the early period, the forces seeking change tend to be clumsy and floundering, primarily on account of their lack of experience of governance, as also the absence of blueprints that would guide them in addressing the challenges of national unity and economic development. Above all, the revolutionary protagonists tend to generate high expectations, as if they have a magic wand that would at one stroke rid the nation of its malaise and replace it with an Eldorado. In Egypt, while the Morsi government repeatedly showed its inexperience, it is possible that, with time and a certain amount of domestic and regional goodwill, it could have been more successful in heading the nascent democratic polity. Al Nahda in Tunisia, perhaps benefitting from the Brotherhood experience in Egypt, appears to be more accommodative in the face of challenges to its monopoly hold on power, agreeing in principle to make way for a government that would be more broad-based.[17]

The geopolitical scenario is fraught with grave uncertainties centred around the Saudi-Iranian rivalry that has security, strategic and sectarian dimensions. It has already cost the lives of over 100,000 Syrians and destroyed historic cities and shrines, with no sign of a positive outcome even in the medium-term. Russia has now asserted its own role in Syria and in regional affairs. It has made clear its opposition to unilateral use of force to effect regime change, as had been done by the west in Libya; it is also deeply concerned about the increasing power and influence of Islamic extremists following the break-down of state authority in parts of West Asia and Northwest Africa. Its initiative to involve the UN system in detecting and dismantling chemical weapons in Syria, thus preventing a US-led assault, seems to have strengthened the possibility of a political solution in Syria at the Geneva-II conference.[18]

The US-Iran engagement could be a "game-changer" in regional affairs, ending a 30-year old estrangement between major regional role-players and opening up the possibility of a more constructive Iranian role in the region. While Saudi Arabia and Iran are deeply divided at present, and seem to be locked in a competition that is seen as existential on both sides, the factual position is that, for most of the period after the Islamic

revolution, Saudi Arabia and Iran had built up mutually beneficial working relationships. Even now, there are at least three important issues where they have a commonality of interests. First, the endless and ultimately futile bloodletting in Syria should encourage the two Islamic giants to re-engage with each other so that a viable political resolution becomes possible. In this regard, both sides will have to compromise on their maximalist positions and work together to unite the country dear to both of them, and contribute to its recovery and development. The second area, where there could be accommodation emerging from dialogue is Iraq. Saudi Arabia sees in the installation of a Shia government the loss of its own strategic outreach, a situation that obviously benefits Iran. This has led Saudi Arabia to rebuff Iraq's overtures and view the country as an Iranian outpost. However, the objective situation is much more complex; as the American scholar of the region Kenneth Pollack has said:

> Iran has the ability to wield considerable influence in Iraq today. From their critical trade ties, to Iran's ability to employ violence in Iraq, to its support for various Iraqi groups, the Iranians have a number of levers they can pull. That said it is important to understand that Prime Minister Nuri al-Maliki himself is no Iranian stooge, as is sometimes wrongly asserted. . . . Although Maliki is a Shia chauvinist, he has also seen himself as an Arab and an Iraqi nationalist.[19]

The third area for cooperation is the scourge of extremist Islam. Al Qaeda is in fact a beneficiary of the competition between Iran and Saudi Arabia, particularly in Syria, though, as noted earlier, it has spread its tentacles across large parts of West Asia and North Africa.

Conclusion

In the early days of the Arab Spring, writers in the Gulf had not made any distinction between the situation in traditional monarchies and authoritarian republics. In an editorial in January 2011, the Saudi daily, *Al-Watan* had said:

> Some Arab leaders should look into the demands of their people more seriously. The people who start uprisings have some specific demands, and they, of course, do not seek to spread anarchy in their countries. . . . The matter may require a real conciliation between Arab regimes and national opposition so that the two sides shall come out with a number of real reforms at all levels which may ward off the spectres of anarchy and destruction from the country.[20]

The popular aspirations for freedom and dignity on the one hand and insistence on governmental accountability and transparency on the other, have now become the most important demands across all the Arab polities. The distinguished Lebanese commentator, Ramzy Baroud, has correctly observed:

> Genuine revolutions have indeed gripped various Arab countries for nearly three years. In fact, the revolutionary influx is still underway and it will take many years before the achievements of these popular mobilizations will be truly felt…. Arab revolutions have not failed, at least not yet. It will take us years, or maybe even an entire generation, to assess their failures or successes.[21]

Though in this early period, the forces representing the old order have curbed aspirations forcefully and intimidated their principal votaries, the aspirations themselves will not die away and will be reasserted. This is primarily because the hasty departure of at least four potentates has taken away the fear of tyranny and its instruments from the minds and hearts of the Arab people. The Spring has truly globalized the Arabs, pulling them out of the suffocating confines of West Asia and making them a part of global values and principles of freedom, democracy and dignity. The move towards real change will happen not just as a result of popular pressure on the streets; every Arab leader today is himself aware of the political, economic and social malaise that characterizes his country and the need for urgent reform. In this regard, the well-known Saudi journalist Jamal Khashoggi, has asserted:[22]

> Local and international intelligence agencies can no longer change history, establish new states, demarcate borders or create leaders. Surely, they can still disrupt history's trails, but they will surely fail to rekindle and steer them as they want.

What has now changed in the "game of nations" is the "power of the people"; this power is still alive, in spite of the "defeats and frustrations" after the Arab Spring and will finally determine the destiny of the Arab world; Khashoggi concludes:

> It is erroneous to resist the power of history by saying that the powerful can make deals and plan for a future disregarding the people whose divisions and lack of experience in democracy allowed local, regional and international cohesive forces to mess with them. The people know what they want, but they are currently confused about it and will surely not accept a conqueror coming on his white

horse to lead them towards a new bright dawn…. The one-man-era has gone.

After the events of 9/11, the Saudi ruler, King Abdullah bin Abdul Aziz in January 2003 had issued his "Charter to Reform the Arab Condition", in which he had stated:

Self-reform and the promotion of political participation in Arab countries represents two basic tools for building Arab capabilities. They provide the conditions needed to realize comprehensive and sustainable development, meet the requirements for positive engagement in international affairs, encourage creative thinking and deal objectively with international changes, notably globalization and the rise of mega economic blocks, as well as catch up with the rapid developments in such areas as technology, communication and information. [Emphasis added][23]

This solemn commitment will be the beacon for change across the Arab world.

NOTES

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2. Dr. Hani Bin Mohammed, *Al-Yaum*, Dammam, 15 February, 2011.

3. An analyst has provided the following break-up of "operationally active" rebel fighters in Syria:

    Jihadists: 10–12,000

    Hardline Islamists: 30,000

    Ikhwani (Brotherhood) Islamists: 30–40,000

    Moderates: 20–25,000

    Kurds: 10,000

    [Dan Murphy, *Syria's Rebels: Lots of Islamists, But What Does that Mean?*, Christian Science Monitor, September 22, 2013, at: http://www.lebanonwire.com/1309MLN/13092202CSM.asp (September 23, 2013).

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7. Ali al-Dhafiri, *Al-Arab*, Doha, translation in *Mideast Mirror*, November 15, 2013.

8. William McCants, "The Gulf's sectarian Syria strategy", *Foreign Policy*, October 1, 2013, at: http://www.lebanonwire.com/1310MLN/13100109FP.asp (October 1, 2013).

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11. Ali al-Dhafiri

12. *Al-Quds al-Arabi*, translation in *Mideast Mirror*, November 22, 2013.

13. Tarek Osman, "The Saudi Spring?", November 13, 2013, at: http://www.project-syndicate.org/commentary/tarek-osman-on-saudi-arabia-as-a-constitutional-monarchy#kY32jsGigXwuDU5V.99 (November 17, 2013).

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15. Renad Mansour and Irfan Azeez Azeez, "The Kurds in a new Middle East", *Foreign Policy*, August 15, 2013, at: http://www.lebanonwire.com/1308/MLN/13081518FP.asp (November 25, 2013); Michael Knights and David Pollock, 'The Kurdish Crescent: New Trends in Syria, Turkey, Iraq and Iran", *Policy Watch*, November 21, 2013, at: http://www.washin.st/1ekccl.J (November 24, 2013).

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17. Talal Salman, "Political Inexperience harmed Arab uprisings", November, 2013, at: http://www.al-monitor.com/pulse/politics/2013/11/islamist-military-arab-spring-politics.html (November 5, 2013); Claire Spencer, "Tunisia: Politics as Usual", *Foreign Policy*, October 2, 2013, at: http://mideast.foreignpolicy.com/posts/2013/10/02/tunisia_politics_as_usual (November 25, 2013); and Duncan Pickard, "Tunisia's Stalled Political Translation", *Atlantic Council*, November 22, 2013, at: http://www.atlanticcouncil.org/blogs/menasource/tunisia-s-stalled-political-transition?tmpl=component&...

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SHRI TALMIZ AHMAD

Shri Talmiz Ahmad joined the Indian Foreign Service in 1974. Early in his career, he was posted in a number of West Asian countries such as Kuwait, Iraq and Yemen and later, between 1987–90, he was Consul General in Jeddah. He also held positions in the Indian missions in New York, London and Pretoria.

He served as Indian Ambassador to Saudi Arabia (2000–03; 2010–11); Oman (2003–04), and the UAE (2007–10). He was also Additional Secretary for International Cooperation in the Ministry of Petroleum and Natural Gas in 2004–06. In July 2011, the Saudi Government conferred on him the King Abdul Aziz Medal First Class for his contribution to the promotion of Indo-Saudi relations. After retirement from Foreign Service, he is working with an Indo-German energy services company and is based in Dubai.

He has published three books: *Reform in the Arab World: External Influences and Regional Debates* (*2005*); *Children of Abraham at War: the Clash of Messianic Militarisms* (*2010*), and *The Islamist Challenge in West Asia: Doctrinal and Political Competitions after the Arab Spring* (*2013*). He writes and lectures frequently on Political Islam, the politics of West Asia and energy security issues.

He can be contacted at: talmiz.ahmad@gmail.com.

The Afghanistan Imbroglio

Brig. (Retd.) R.R. Palsokar

INTRODUCTION

There will eventually be peace in Afghanistan. Some day Afghanistan will take its rightful place in the comity of nations. One day the country will become a normal country again. However, it is unlikely that any of this is likely to happen in the near future. In fact, things are likely to get worse before they start improving. Why this dire prognosis? Is there no way ahead but towards chaos, instability and violence?

The roots of the present conditions in Afghanistan can be traced to its distant as well as its recent past. It is a society that is still medieval in tradition, feudal in character, where tribal loyalties outweigh all other. As a result, there is an inbuilt conflict in society, where the nation is a distant prospect, region more predominant and tribal loyalties paramount. This reflects itself in a society where development is glacial, education is neglected and women treated as chattels and all this happens under the mantle of religious fundamentalism. If this paints an unnecessarily bleak picture for the future of Afghanistan, add to this great power rivalry, active interference by an aggressive neighbour Pakistan, and above all staining everything a spreading blood red blot, the violence of Taliban. It is a recipe for turmoil and strife and instability.

India stands on the periphery, with its national interests tied to stability in Afghanistan. The prospects are bleak and will require not only nimble diplomacy but also eternal vigilance.

So this article will focus on Afghanistan and Pakistan which is the cause of most of its troubles. It is proposed to focus more on Afghanistan and see how it impinges on Pakistan, because it is the troubled situation

in Afghanistan which is affecting the security scenario in Pakistan and vice versa, and in turn its ripple effects on India.

Addressing an informed readership where the main issues are known, it is proposed to examine the linkages and ask and answer if possible, what are the reasons for this imbroglio, can it be ameliorated and above all, what should be India's stand. May be that would highlight some of the approaches India could take to tackle the challenges that emanate from both these countries.

HISTORICAL BACKGROUND

Afghanistan as a nation is relatively new, though the country has been fought over since ancient times, particularly as it controlled the gateway to the riches of India. Darius, King of Persia (521–486 BCE) had conquered this land and following his footsteps two centuries later, Alexander of Macedon in 334 BCE, started on his victorious march till he came to the frontiers of India at what now is modern Jelalabad. Here his favourite general Hephaestion crossed the Khyber Pass while Alexander moved north and northeast into the Kunar valley and from there entered the Swat valley (Suvastu in Sanskrit), subduing the wild tribesmen who opposed him. Having defeated them, he then floated down the Indus from the North to link up with Hephaestion at modern Attock. The tribesmen of Bajaur and Malakand, who are giving the Pakistani army a tough time today, can count their exploits from antiquity. After Alexander we come to Mahmud of Ghazni, Muhammad Ghori (1001–1024), the Mongols, followed by Timur Lang in the 13th century and Babar (1526) the first great Mughal, who was an Uzbeg. It is in 1737 that Nadir Shah of Persia captured Kandahar and Kabul on his way to India. Nadir Shah was murdered on his return in 1747 and Ahmed Shah Abdali who was a Pathan, having captured Nadir Shah's treasury, declared himself King and formed the contours of modern Afghanistan. *It is of interest to note that till the late 19th century the terms Afghan and Pathan were synonymous and interchangeable.*

By the end of the 18th century, Napoleon Bonaparte with his army in Egypt was in correspondence with Tipu Sultan in southern India and planning to invade India in conjunction with the Czar of Russia. This marks the beginning of the so-called "Great Game", which the British imperialists constantly worried about as the Russian sought an approach to the sea. To secure the frontiers of their Indian empire, the Durand Line was drawn by the British in 1893 to demarcate the boundary between

Map 1

(The borders of India shown on this map are neither authentic nor official)

Afghanistan and India. It suited the British Empire to keep this area under-developed. Note the British Empire's three lines for the defence of India. The frontier of Afghanistan with Iran, Russia and China demarcated the outer limit of British sphere of influence. The second, the Durand Line which was never accepted by the Afghans, divided Pashtun tribal areas from the territory of Afghanistan, and the third and inner line of the Pakistani tribal areas comprising Federally Administered Tribal Areas (FATA) separated the British administered or settled areas of the North West Frontier Province.

It is my contention that the present problems besetting Afghanistan and Pakistan stem from this artificial demarcation of the frontier. As successor to the "Great Game", the geo-strategic importance of Afghanistan has only increased in modern times, not only as part of great power rivalry but also in view of the energy resources of the Central Asian Republics and the global scramble to get access to these resources. The succour provided to terrorists particularly to Al Qaeda, on the borders between Afghanistan

and Pakistan and the US war against terror has only served to accentuate the strategic importance of this area.

AFGHANISTAN – POST 1947 TILL THE SOVIET INVASION

While Afghanistan has always been an independent country, it was very much under the influence of the British Empire. The three Afghan wars which the British fought are a testimony to this. Significant for modern times, is that Mohammed Zahir Shah became King in 1933 and reigned till 1973. His reign is now remembered with nostalgia because the country remained at peace during his reign. But with increasing democracy, slowly the Communists came into prominence and Soviet influence increased. During the Cold War this was unacceptable to the West. Apprehending western intervention, Zahir Shah was overthrown in a coup, and it could be said that Afghanistan's problems began in real earnest. The trigger for the crisis that followed was the overthrow of the Shah of Iran in 1979 and fearing American interference in their sphere of influence, the Soviets invaded (intervened in?) Afghanistan in December 1979. Sensing a way to humiliate the Soviets, the US backed Mujahideen who fought the Soviets and after a ten year period, the Soviets were forced to withdraw in 1989. Soviet withdrawal gave great satisfaction to the US and its allies. Little did they know that very shortly they would be facing similar problems. Afghanistan has not been called "the graveyard of empires" without reasons.

A government was formed under Gulbuddin Hekmatyar who was backed by Pakistan and a civil war soon broke out with the opposition coalescing under the banner of the Northern Alliance led by Ahmed Shah Masood. Once the Soviets withdrew, the Americans lost interest and anarchy ruled in Afghanistan. The conditions became so intolerable that the Taliban, under the guise of bringing order were able to wrest power in 1994, backed as they were by Pakistan.

ETHNIC DISTRIBUTION

It has been said in the beginning that Afghanistan is medieval in outlook with feudal tribal loyalties holding sway. To underline this point, start by looking at Afghanistan's geo-strategic location. From the west, you have Iran, Turkmenistan, Uzbekistan and Tajikistan. To the east and south are Pakistan's North West Frontier Province, FATA and Baluchistan, all restive provinces. Look now at the distribution of the ethnic groups – south of the Hindukush is mainly Pashtun or Pakhtun[1] who are 38 per cent of the

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[1] Both pronunciations are used depending on the part of the country.
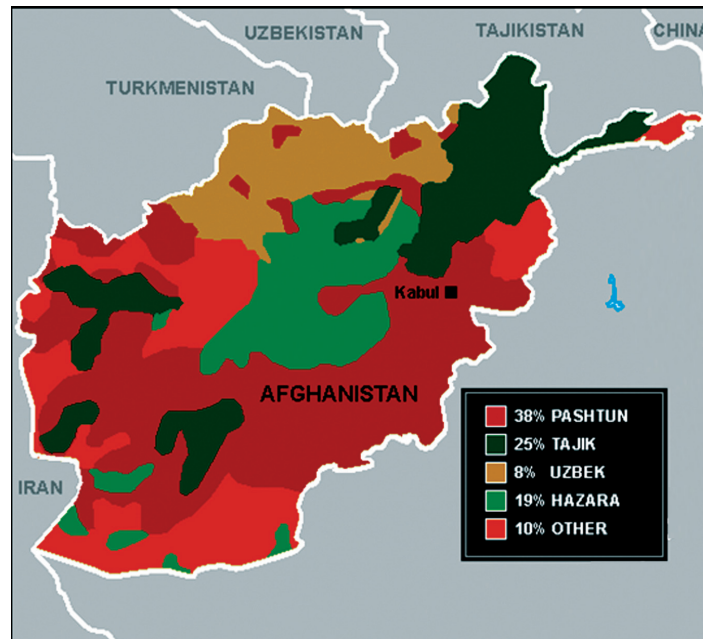
Map 2

population of some 31 million; rest being Tajiks 25 per cent, Hazaras 19 per cent, Uzbegs 8 per cent and others 14 per cent. The bulk of Pakistan's Pathans who form 15 per cent of the population and Baluch 4 per cent that is almost one fifth of the total population, live in contiguous areas of FATA, NWFP and Baluchistan.

To keep the area under control, the British had demarcated Afghanistan's border with India, and this has now become the *de facto* boundary between Afghanistan and Pakistan. This boundary took little notice of how the Pathan tribes were divided along the frontier and not having recognized the boundary earlier, after 1947 Afghanistan still refused to affirm the Durand line and laid claim to FATA. Pakistan has had a number of opportunities to formalize the boundary; the most recent one being after the Soviet occupation of Afghanistan was defeated. But, in their search for strategic depth against India it suited Pakistan to have an unformalized border. This needs explanation. General Zia ul Haq visualized a Pakistan influenced region extending into Central Asia, resting on an undefined border so that the Pakistani army could justify any future interference in Afghanistan and beyond. As long as there was no recognized border, there was no breach of international law if Pakistan
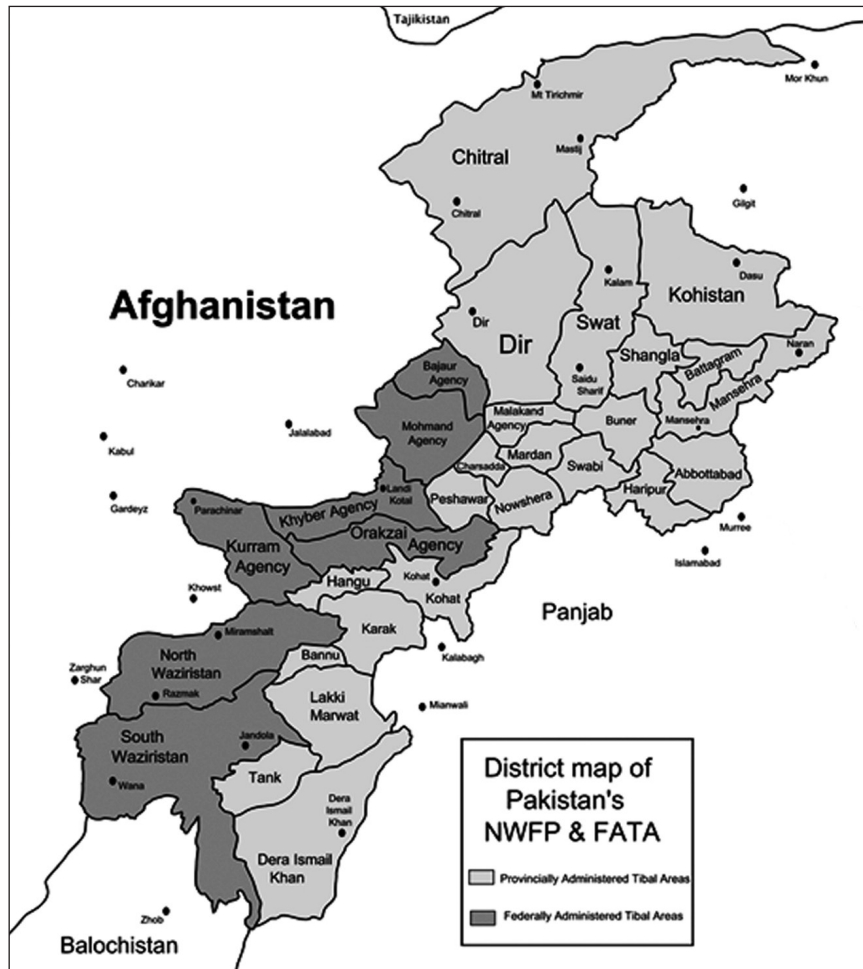
Map 3

(The borders of India shown on this map are neither authentic nor official)

forces were to support surrogate Afghan regimes such as the Taliban. It would not be too farfetched to think that the Pakistani generals had the tacit if undeclared acquiescence of the Americans to pursue this line of strategic thought.

The same logic applied to FATA. A little over three million tribesmen populate the seven tribal agencies comprising FATA – naming them from the North, Bajaur, Mohmand, Khyber, Orakzai, Kurram and North and South Waziristan. The tribes on both sides of the border inter-marry, trade,

feud and celebrate with each other. They all adhere to Pashtunwali, the tribal code of honour and behaviour, which includes hospitality including that to a fugitive and *badl* or revenge. The FATA administrative system was dreamed up by the British. It was and is even today a designated Federal Area directly under the Pakistani president whose "agent" is the governor of the North West Frontier Province, who in turn appoints "political agents" to each agency. In brief, the system may be described that in return for keeping the roads (federal territory) clear, the tribal chieftains were paid to maintain law and order according to tribal laws in their respective territories, irrespective of however barbaric the tribal code may be. Today, though there is universal adult suffrage in Pakistan, political parties are banned from operating in FATA. So really tribesmen of the agencies cannot claim constitutional, civic or political rights or protection of the Pakistani courts. FATA is still off-limits to journalists, NGOs, human rights organizations and political parties. This arrangement suited even the Americans when they were pumping in support to the Afghan Mujahideen against the Soviets. So, it was not difficult for the Pakistani army and the ISI to shift Kashmiri militants into this area and subsequently for Al Qaeda and Taliban to find bases here. That the local leadership has been routed and replaced by the Taliban has made matters much worse and disturbed the traditional channels of leadership. One major consequence of this overthrow of traditional leadership has been to allow the Taliban to raise the banner of religious fundamentalism, which in turn brooks no argument or opposition.

Western Involvement and Influence

Once the Soviets moved into Afghanistan in 1979, the low level insurgency against the Afghan regime became a full-fledged Jihad against the "invaders". The US and Saudi Arabia gave billions of dollars to back the anti-communist Afghan Mujahideen and the Arab auxiliaries – *laying the foundation for an infrastructure of regional and global Jihad.* The Geneva accords of 1988, provided for the withdrawal of Soviet troops and end of foreign assistance to the Mujahideen. But the West, read America, ignored their part of the bargain and the Afghan state collapsed leading to anarchy, because various warlords with their armies of Mujahideen would accept no authority other than their own. The Taliban stepped into this breach.

The Taliban first came to prominence in the latter part of 1994 under the leadership of Mullah Mohamed Omar, who had lost his right eye fighting the Soviets. The Taliban promised to restore peace and security

and enforce the *Sharia*. The Afghan population, weary of anarchy, generally welcomed the Taliban, who then stamped out corruption, curbed lawlessness, opened the roads and by 1998 they were in control of almost 90 per cent of Afghanistan. Pakistan has always been rightly seen as the architect of the Taliban. It was also one out of only three countries along with Saudi Arabia and the UAE, which gave formal recognition to the Taliban regime. Very soon after establishing control, the Taliban made themselves unpopular by their harsh measures as well as rigid and barbaric enforcement of the *Sharia*. But the real breaking point came in 1998 with the August bombings of US embassies in Kenya and Tanzania which left over 225 dead. The US wanted the Taliban to hand over Osama bin Laden who was head of Al Qaeda, which the Taliban adhering to the code of Pashtunwali, naturally refused. UN sanctions were imposed in 1999 and 2001. After the 9/11 attacks, the US once again demanded that Taliban hand over Osama bin Laden or face consequences. As the US gave a similar ultimatum to Pakistan, they were compelled to break diplomatic ties with the Taliban. This forced General Pervez Musharraf to do a u-turn and agree to join America's war on terror. The Taliban had no such room for manoeuvre and refused, and had to be prepared to face whatever followed. As a consequence of Taliban obduracy, on 7 October 2001 a US led coalition intervened militarily in Afghanistan and by the first week of December the Taliban regime had collapsed. The Taliban were soon cornered and along with them also their Pakistani handlers and supporters. It is only the connivance of the US that allowed Pakistan to extricate its soldiers. It is not necessary to describe the Pakistani involvement in the rise and escape of Taliban, but one of the concessions that Pervez Musharraf extracted from America for his cooperation was that the Indian military would not be involved in the overthrow of the Taliban, nor would be allowed into Afghanistan.

The chaos that followed American overthrow of the Taliban created a leadership vacuum. Hamid Karzai, then a Pashtun chieftain of the Popalzai tribe (and thus a distant descendant of Ahmed Shah Abdali who had been the first Pathan ruler of Afghanistan), showing pluck and resolve stepped into this breach and raised a banner of revolt against the Taliban leadership. In this he was helped by the Americans, because his perseverance and personal bravery had convinced the Americans that he was worth backing. But Karzai's leadership had to be formalised so that he became acceptable to the international community. On 27 November 2001, all Afghan factions gathered in Bonn for a UN conference to choose

an interim governor and a leader, and the mantle formally fell on Hamid Karzai as a consensus candidate. He was sworn in on 22 December 2001 as the President. But the Taliban were not yet finished, nor did Karzai's dictum run very much beyond Kabul. Afghanistan was and remained essentially a fiefdom of various warlords, who chose to listen or otherwise to Hamid Karzai, depending on their selfish interests.

International Security Assistance Force (ISAF) and Operation Enduring Freedom (OEF)

To bring stability to Afghanistan, the UN Security Council established the International Security Assistance Force in December 2001. Its stated role was to promote security and development. ISAF had personnel from 41 different countries including the US, Britain, Canada, European countries, Australia, Jordan and New Zealand. The largest contributing nations were the US and Britain. The US also had troops under Operation Enduring Freedom, mostly in the east of Afghanistan on the border with Pakistan.

The American intervention in October 2001 had led to the routing of Taliban, but the problem of governing the country under a central leadership remained. Karzai was at best a Kabul based power source. The governors of provinces bordering Iran, Uzbekistan, Tajikistan which are north of the Hindukush, ran their fiefdoms very much autonomously, and followed the diktats of Kabul as and when it suited them, mainly to garner large sums of money that were being poured into Afghanistan by the Americans and the international community. The southern provinces bordering Pakistan remained restive, subject as they were to tribal pressures from across the border and machinations of the ISI aided and abetted by the Pakistani government.

The ISAF was faced with the classic counter-insurgency dilemma, "development without security is unachievable and security without development is meaningless". The Americans lulled by the early initial military successes felt that pouring money would solve the problem so long as the Taliban was kept under check. But they soon discovered what the British Empire and the Soviets had experienced before them. While it was one thing to win local battles, it was altogether a different matter to keep the peace and maintain the authority of the Central government. The tribes both north and south of the Hindukush were not amenable to central leadership. The Americans were initially able to prevail upon the various countries forming part of the ISAF to contribute men and materiel, but as casualties started mounting, the governments contributing troops slowly

became disillusioned and started withdrawing troops under one pretext or another. Since 2001, almost 3400 ISAF soldiers have been killed in Afghanistan; of these almost 2300 have been US soldiers, approximately 450 British and the rest about 650. These are heavy casualties by any standards.

The Americans having initially decided on a strategy of "counter-insurgency", i.e. defeating the insurgents and establishing a stable administration, later developed the limited aim of "counter-terrorism", i.e. defeat the terrorists and try and make peace with those among them who were amenable to persuasion. This was to be done by building up Afghan National Security Forces and helping Hamid Karzai establish a modicum of administration.

But to go back to the tribal and regional loyalties of the people and the Kabul administration remained just that – a distant authority, to be acknowledged as and when convenient. This was and still is exacerbated by corruption, ineptitude and the depredations of the Taliban who found themselves a secure sanctuary in the tribal agencies of Pakistan, in particular, in North Waziristan. As a result, US-Pak relations have always remained fraught. Two incidents in particular may be considered as key flash points.

The Americans were on the trail of Osama bin Laden since long, but they were unable to find him. However, having finally located him, in a daring raid on 1 May 2011 US Navy SEALS assaulted and killed bin Laden in a compound in Abbotabad, less than a mile away from the Pakistan Military Academy at Kakul (Abbotabad and Kakul are like Pune and Khadki in their proximity). We shall possibly never know how complicit the Pakistan Army and its leadership was in this raid, but enough conspiracy theories exist to fuel fevered imaginations.

As if this was not enough, on 26 November 2011, US troops on the Afghan-Pakistan border, attacked a Pakistani regular army border post at Salala and killed 24 Pakistani soldiers manning the post. This extraordinary incident brought relations to the breaking point between the two countries. After some contretemps, matters were resolved, but since then the Americans have depended upon drone strikes to eliminate Taliban leadership. The latest in the series of these strikes has been the killing of Hakimullah Mehsud, the Taliban chief, who was hit in his palatial mansion, less than a kilometre from the local Pakistani military headquarters in Miranshah.

AMERICAN WITHDRAWAL

The US President, Barack Obama having tried many options finally decided on withdrawal of all US troops from Afghanistan by the end of December 2014, just about one year hence. The drawing down of troops and equipment has already begun, and the Taliban and their backers sense victory. But the Americans are not prepared to leave Afghanistan unguarded and let the Taliban roll in as they did after the Soviet withdrawal. The main question is how many troops the US will leave behind to train and support the Afghan National Security Forces. At the time of writing, this is the main debate. Hamid Karzai whose term as President runs out in May 2014, is desperately negotiating a deal that he hopes will allow him a say even after giving up his presidency. All that can be said at this time is that while the negotiations will be tortuous, Afghanistan cannot survive without aid from western countries and particularly the US. So finally the US will have its way, but expect many fits and starts and much disagreements.

INDIA'S INTERESTS AND ROLE

India is not inactive in Afghanistan. Indian assistance is widespread across a broad spectrum of activities. Today, besides the embassy in Kabul, India has consulates in Jelalabad and Kandahar in the east and Mazar-e-Sharif and Herat in the west. India is helping in the building of infrastructure projects to include power transmission, hydro-electricity, irrigation and road construction. The building of the road Delaram to Zaranj has a strategic importance as it links Afghanistan to the Iranian port of Chabahar. Additionally, India is providing assistance in health care in a major way by establishing hospitals in Kabul, Mazar-e-Sharif, Herat, Kandahar and Sheberghan. Artificial limbs in terms of the Jaipur foot are also being provided. Large numbers of Afghanis are being trained in India in various disciplines, including some in Pune. Indian assistance has been in excess of USD one billion, and has found much favour and support among the common Afghan populace.

Pakistan views Indian assistance with suspicion. But also remember that only a few years ago India acknowledged the presence of a 25 bed hospital on the Afghanistan–Tajikistan border at Farkhor in Tajikistan set up to support the Northern Alliance, and the first ever airbase outside the country is located at Ayni which is 10 kilometers northeast of the Tajikistan capital Dushanbe. This airbase has forward facilities at Farkhor.

Needless to say this sort of outflanking is of concern to Pakistan. Be that as it may, it only shows that India is aware of Pakistani machinations and is quite prepared to deal with it suitably.

Indian Challenges

The Afghanistan situation is one of the major diplomatic challenges for Indian diplomacy and it does appear that our response in the last few years has been robust and farsighted. It is in this vein that I feel that any future Indian responses should be predicated on the following issues:

- Recognise that the western world and particularly the US is weary of constant India–Pakistan stand offs, more so now that both countries are declared nuclear powers. But given the rise of terrorism and support for it in Pakistan, India's concerns are better understood around the world and particularly in the west. India must build upon this.
- Expect further US initiatives to open dialogues with the so called "good Taliban".
- Presently US attention is focused on the Iranian nuclear program. Should US – Iran relations improve as they well might, it would be to India's advantage because Iran has always looked to India for trade and commerce. This in turn would give us a secure flank on Afghanistan's western border. The link to Chabahar port will then become even more important.
- Expect Pakistan to woo China as an honest broker in view of its interest in and development of mineral resources and access routes, both in Afghanistan and Pakistan, including the expansion of Gwadar port and improvement of the Karakoram Highway and as a counter to lessening US interest.
- As the American drawdown gathers pace, expect the Taliban to be emboldened and appeased by Pakistan's political parties.
- Expect the Pak political theatre to continue for some time to come with the army still the predominant player. So whatever happens we cannot let our guard down. There is no peace dividend for India in the near future.

What India Could Do

India has many interests in Afghanistan, the main ones being historic as well as geo-strategic. Above all, it allows access to what is commonly perceived as Pakistan's weaker flank. The steps being taken towards short-term goals are already in hand. In the fluid situation, it may be difficult to

even identify long-term goals. In the middle term, the following would be of consequence:

• Deal with Afghanistan as if it is two different countries, one, the southern Pashtun part over which expect no assistance or sympathy or even headway, particularly after American withdrawal by the end of 2014, and two, the northern non-Pashtun part where cooperation with the local warlords and neighbouring countries is possible and feasible. This needs to be exploited and strengthened.
• Keep the Iranian connection open, both in terms of the Afghan frontier as well as energy needs.
• The Afghan access to Central Asian Republics and their energy resources must be kept open for the long term.
• These difficult times represent some of the greatest challenges for Indian diplomacy. We have to meld our increasing economic clout to our diplomatic initiatives to further the country's future needs.

<div align="center">CONCLUSION</div>

Admittedly, we are at the centre of a troubled neighbourhood, but much of our energy needs; conventional as well as nuclear fuel would have to be sourced from the Central Asian Republics. Our presence and influence in Afghanistan will be vital for this.

In this fast changing situation, our foreign policy on our western border must not be Pak-centric, but encompass a larger region which includes Afghanistan and its neighbouring countries. Presently, Pakistan's capability will remain limited to creating mischief – expect more of this. However, that country will have to put its house in order if it wants to progress. There is hope for India in this and gives us a window of opportunity to secure our geo-strategic interests in the near and middle future. Our foreign policy must be pro-active. It is time to be bold.

Because of the recent history of war and terrorism, the world has developed a distorted image of Afghanistan. But remember, till the late 1960s, Afghanistan was considered a picturesque place with much natural beauty; prosperous because of its agriculture and produce of fruits and nuts. Afghan carpets matched Persian ones. Its people were considered friendly and with quaint customs. It certainly did not have today's malevolent reputation. Given time and resolve, its problems can be solved. It is in India's interests to see peace in Afghanistan. But for this, we and the world will have to help. It is a difficult task but will have to be tackled sooner or later.

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BRIG. (RETD.) RAVI PALSOKAR

Brig. Ravi Palsokar is an Infantry officer who belongs to a military family. He is the second of three generations to serve in 2 Guards (1 Grenadiers), a battalion which both he and his son have commanded. He is a graduate of the British Army's Staff College at Camberley and also of the US Army's Command and General Staff College at Fort Leavenworth, Kansas. Later he commanded 7 Infantry Brigade as part of the IPKF in the Mullaittivu district of Northern Sri Lanka throughout its entire tenure till its de-induction in December 1989. His brigade was involved in some of the heaviest fighting during his two years there. He subsequently took premature retirement in early 1993.

He is a prolific author who writes in both English and Marathi. His columns appear regularly in Marathi papers published from Pune/Mumbai. He has written about his brigade command in the IPKF in his book, "*Ours Not to Reason Why*". He is also a military historian and has collaborated in writing of a number of regimental histories. Presently, he is working on a book in Marathi on Sri Lanka and the defeat of the LTTE.

Managing National Security
Threats, Challenges and Conflict Resolution

Brig. (Retd.) Gurmeet Kanwal

REGIONAL SECURITY ENVIRONMENT

Southern Asia is the second most unstable region in the world after West Asia. The conflict in Afghanistan, India's unresolved territorial and boundary disputes with China and Pakistan and continuing internal security challenges are a cause for concern. With a history of four conflicts in 65 years, and three nuclear-armed adversaries continuing to face off, Southern Asia has been described as a nuclear flashpoint. Hence, in view of the ongoing conflicts and the possibility of new conflagrations, in the short term, Southern Asia will continue to witness further turbulence.

The regional security environment in Southern Asia continues to be marred by the endless conflict in Afghanistan. The situation can be characterised as a stalemate at the tactical and strategic levels. Despite this, the US-led NATO-ISAF coalition has begun to draw-down forces. This will continue with the Taliban and the NATO forces alternately gaining local ascendancy for short durations in the core provinces of Helmand, Marja and Kandahar. The Afghan National Army is still many years away from achieving the professional standards necessary to manage security on its own. It will, therefore, be difficult for the US to successfully complete its planned drawdown of troops in December 2014.

Pakistan's half-hearted struggle against the remnants of the al-Qaeda and the Taliban, fissiparous tendencies in Baluchistan and the Pushtun heartland, continuing radical extremism and creeping Talibanisation, the unstable civilian government, the floundering economy and,

consequently, the nation's gradual slide towards becoming a "failed state", pose a major security challenge for the region. Unless the Pakistan army gives up its idiosyncratic notions of seeking strategic depth in Afghanistan and fuelling terrorism in India, and concentrates instead on fighting all varieties of Taliban that are threatening the cohesion of the state, instability in Pakistan will continue.

Further east, the long-drawn military stand-off along the 38th Parallel and North Korea's desperate efforts to acquire nuclear weapons have exacerbated an already unstable situation in East Asia caused by increasing Chinese assertiveness that is completely out of character with its stated objective of a peaceful rise. Though the international community may be able to ensure that a major conflict does not erupt again between the two Koreas, the sub-region will remain volatile unless the Chinese use their influence with North Korea to persuade it to back off from the path of confrontation. Turmoil in West Asia will continue as the situation in Syria shows no signs of improving, and Israel stubbornly refuses to halt the construction of new settlements in the West Bank and the Palestinian militias get increasingly more restive. The collusive nuclear weapons-cum-missile development programme of China, North Korea and Pakistan and Iran's quest for nuclear weapons are issues of serious concern.

Iran's nuclear ambitions and the vaguely stated threats of several of its neighbours to follow suit are a major cause of potential instability in the region. Saudi Arabia, in particular, may fund Pakistan's nuclear expansion programme as a hedging strategy against the acquisition of nuclear weapons by Iran. Such a course of action would be a disastrous blow to international non-proliferation efforts. Sri Lanka's inability to find a lasting solution to its ethnic problems despite the comprehensive defeat of the LTTE (Liberation Tigers of Tamil Eelam) has serious repercussions for stability in the island nation. Bangladesh is emerging as the new hub of Islamist fundamentalist terrorism, despite the incumbent government's efforts to curb the menace, even as it struggles for the economic upliftment of its people.

It can be deduced from recent raids and arrests in Africa and elsewhere that international fundamentalist terrorists may succeed in launching another spectacular strike in the West. Such a strike would resurrect the al-Qaeda and enable it to rally its wavering cadres.

Simmering discontentment in Tibet and Xinjiang against China's repressive regime is gathering momentum and could result in an open

revolt. The peoples' nascent movement for democracy in Myanmar and several long-festering insurgencies may destabilise the military Junta despite its post-election confidence. The movement for democracy could turn violent if the ruling Junta continues to deny its citizens basic human rights. The continuing spill-over of religious extremism and terrorism from Afghanistan is undermining regional counter-terrorism efforts. Other vitiating factors impacting regional stability in Southern Asia include the unchecked proliferation of small arms, being nurtured and encouraged by large-scale narcotics trafficking and its nexus with radical extremism.

India's standing as a regional power that has global power ambitions, and aspires to a permanent seat on the UN Security Council has been seriously compromised by its inability to successfully manage ongoing conflicts in its neighbourhood, singly or in concert with its strategic partners. These conflicts are undermining Southern Asia's efforts towards socio-economic development and poverty alleviation by hampering governance and vitiating the investment climate. It appears inevitable that in the foreseeable future, the Southern Asian region and its extended neighbourhood will see a continuation of ongoing conflicts without any major let up. In fact, the situation in Afghanistan and Pakistan could deteriorate beyond the ability of the international community to manage it effectively.

External and Internal Threats

For India, the key geo-strategic challenges in Southern Asia emanate from the ongoing conflict in Afghanistan and on the Af-Pak border; unresolved territorial disputes between India and China as well as with Pakistan; and the almost unbridled scourge of radical extremism that is sweeping across the strategic landscape. In May 1998, India and Pakistan had crossed the Nuclear Rubicon and declared themselves states armed with nuclear weapons. Tensions are inherent in the possession of nuclear weapons by neighbours with a long history of conflict. The latest manifestation of this long-drawn conflict is the 25-year old state-sponsored "proxy war" waged by Pakistan's ISI-controlled mercenary terrorists, against the Indian state.

While there has been some nuclear sabre-rattling between India and Pakistan in the past, particularly during the Kargil conflict, the two nations have never come even remotely close to a situation of deterrence breakdown. The "ugly stability" that is prevailing can be attributed

primarily to India's unwavering strategic restraint in the face of grave provocation, democratic checks and balances in its policy processes and tight civilian control over its nuclear forces. However, the Pakistan army, which also controls the country's nuclear arsenal, has lost India's trust after the Kargil conflict, the attack on the Indian Parliament in December 2001 and the terrorist strikes in Mumbai in November 2008, all of which were engineered by the ISI. It has once again stepped up cease-fire violations and the continuing trans-Line of Control (LoC) terrorism could even engender a Kargil-like situation that could escalate into a major war.

India's border with China has been relatively more stable than that with Pakistan, but for the recent incidents near Daulat Beg Oldie (DBO) in Ladakh. However, China is in physical occupation of 38,000 sq km of Indian territory in Ladakh, J&K, and claims the entire Indian state of Arunachal Pradesh (96,000 sq km) in the north-east, particularly the Tawang tract. Even the Line of Actual Control (LAC) has not been demarcated on the ground and on military maps. Recently, China has exhibited unprecedented assertiveness in its diplomacy and military posture. Frequent transgressions of the LAC by the PLA's Border Guards could lead to a local border incident. Until the territorial dispute between the two countries is resolved satisfactorily, another border conflict cannot be ruled out even though the probability is quite low.

The nuclear, missile and military hardware nexus between China and Pakistan, and China's increasing diplomatic, political and military assertiveness towards India at the tactical level, continue to underline the existential military threat from both these countries. China is engaged in the strategic encirclement of India by assiduously wooing Bangladesh, Myanmar, Nepal and Pakistan among India's land neighbours to degrade India's influence, and following a "string of pearls" strategy to eventually acquire naval bases around the Indian peninsula in the northern Indian Ocean region for maritime domination. Hence, China poses a long-term strategic challenge to India as a geo-political competitor and rival for markets and energy security in Asia.

China does not recognise India as a state armed with nuclear weapons and demands that India should go back to a non-nuclear status in terms of UNSC Resolution 1172 and, hence, refuses to discuss nuclear confidence building measures (CBMs) and nuclear risk reduction measures (NRRMs) with India. There is also a collusive nexus between China and Pakistan for the development of nuclear weapons, nuclear-capable missiles and military hardware. Most analysts in India believe that this nexus will lead

India having to face a two-front situation during any future conflict and India must, therefore, evolve a two-front military strategy.

The prevailing security environment in Southern Asia is not conducive for long-term strategic stability, even though in the short-term there is no cause for major concern. India is developing robust military capabilities and is in the process of upgrading its military strategy against China from dissuasion to deterrence. In the field of nuclear deterrence, India is moving steadily forward towards the deployment of the third leg of its triad, i.e. nuclear-powered submarines armed with submarine-launched nuclear-tipped ballistic missiles (SSBN with SLBMs). This will give India genuine nuclear deterrence capability so as to prevent deterrence breakdown and reduce the risk of nuclear exchanges in any future conflict.

India's internal security environment has been vitiated by Pakistan's two-decade old proxy war in Jammu and Kashmir, continuing insurgency in several of India's north-eastern states, the rising tide of Maoist or Naxalite (left wing) extremism in Central India and the new wave of urban terrorism, which peaked with the dastardly attacks in Mumbai on 26 November 2008. Besides central and state government paramilitary and police forces, the Indian Army has been deployed in large numbers to gain control over internal uprisings, some of which are supported, sponsored and militarily aided by inimical foreign powers, especially the Pakistan Army and ISI. However, India's fightback is haphazard and lacks coherence, both in the formulation of a comprehensive internal security strategy and its successful execution. The acquisition and dissemination of intelligence for preventing terrorist strikes are also patently flawed.

<div align="center">CONFLICT RESOLUTION</div>

The ultimate objective of maintaining armed forces is to deter war; fighting and winning become necessary only if deterrence breaks down. As the primary underlying cause of future conventional conflict on the Indian sub-continent is likely to be unresolved territorial and boundary disputes, it is necessary to speedily resolve the existing disputes. Despite 16 rounds of talks between India's National Security Advisor and China's Vice Foreign Minister, it has not been possible to make any major headway in the resolution of the India-China territorial dispute. In fact, it has not even been possible to demarcate the Line of Actual Control on the ground and on military maps, so as to prevent frequent complaints about intrusions and transgressions and to minimise the probability of an armed

clash between patrols. China's intransigence and its recent claims to the Tawang tract have led to a stalemate in negotiations. On its part, India must continue to impress on the Chinese leadership the importance of the early resolution of the territorial and boundary dispute. Simultaneously, India must continue its efforts to improve border infrastructure and create adequate capability for offensive operations to deter another round of conflict.

Resolution of the dispute with Pakistan over Jammu and Kashmir is equally complex as**,** besides India and Pakistan, the people of J&K – straddling the Line of Control (LoC) – are also caught up in the conflict. While some progress had been made during the Musharraf regime, the General's troubles at home led him to back off. A ray of hope had emerged once again with the installation of an elected civilian government in Pakistan, but the terror strikes in Mumbai in November 2008 put paid to the rapprochement process, which is still in limbo despite the meeting between the two Prime Ministers in New York in September 2013. Neither government has made any effort to mould public opinion for a possible solution. Entrenched political and fundamentalist constituencies are likely to noisily stall any understanding that the two governments might reach. Hence, it is difficult to be optimistic about an early resolution of the Kashmir dispute.

In stark contrast with the difficulties of conflict resolution on the external front, the last couple of years have seen substantial progress in resolving internal conflicts. The central government's cease-fire with the Nagas, which has now held fairly well for over a decade even while internecine quarrels among the Nagas have continued, has led to tangible progress in negotiations with both the Issak-Muivah and the Khaplang factions of the NSCN. There is cause for optimism about the early resolution of the long-drawn conflict. The ULFA in Assam has begun negotiations with the central government without any pre-conditions, except for the break-away military wing led by Paresh Barua who is said to be taking shelter in Myanmar and is getting covert support from the Chinese. It is to be hoped that the ULFA leadership will act in a statesman-like manner for the good of the people of Assam, rather than continue to pursue power for its own sake.

There is less cause for optimism regarding resolution of the conflict being waged by Maoist or Naxalite insurgents in almost 220 districts of Central India. Their leadership seeks to one day fly its flag from the ramparts of the Red Fort in Delhi and is pursuing its aim methodically and

systematically. Despite the Home Minister's offer for talks, it continues to indulge in wanton acts of violence, kidnappings and extortion. A comprehensive three-pronged strategy that simultaneously emphasises security, development and governance – with skilful perception management – is necessary to defeat the menace of Left Wing Extremism (LWE).

Managing National Security

The first and foremost item on the government's defence and national security agenda should be the formulation of a comprehensive National Security Strategy (NSS), including internal security. The NSS should be formulated after carrying out an inter-departmental, inter-agency, multi-disciplinary strategic defence review. Such a review must take the public into confidence and not be conducted behind closed doors. Like in most other democracies, the NSS should be signed by the Prime Minister, who is the head of government, and must be placed on the table of Parliament and released as a public document. Only then will various stakeholders take ownership of the strategy and work unitedly to achieve its aims and objectives.

The armed forces are now in the second year of the 12th Defence Plan (2012-17) which has not yet been formally approved by the Cabinet Committee on Security (CCS). The government has also not formally approved the Long Term Integrated Perspective Plan (LTIPP 2007-22) formulated by HQ Integrated Defence Staff. Without these essential approvals, defence procurement is being undertaken through *ad hoc* annual procurement plans, rather than being based on duly prioritised long-term plans that are designed to systematically enhance India's combat potential. These are serious lacunae as effective defence planning cannot be undertaken in a policy void. The government must commit itself to supporting long-term defence plans, or else defence modernisation will continue to lag and the growing military capabilities gap with China's People's Liberation Army will assume ominous proportions. This can be done only by reviving the dormant National Security Council (NSC) as defence planning is in the domain of the NSC and not the CCS, which deals with current and near-term threats, and challenges and reacts to emergent situations.

The inability to speedily conclude major defence contracts to enhance national security preparedness in the face of growing threats and

challenges, exemplifies the government's inability to grapple with systemic flaws in the procurement procedures and processes. Despite having formulated the Defence Procurement Procedure (DPD) and the Defence Production Policy (DPrP), the government has been unable to reduce bureaucratic red tape and defence modernisation continues to stagnate. It is difficult to understand why budgetary allocations earmarked on capital account for the modernisation of the armed forces should continue to be surrendered year after year with complete lack of accountability. The year FY 2010-11 had brought some encouraging news as the Ministry of Defence (MoD) managed to fully utilise all the funds that were allocated on capital account.

While internal security challenges are gradually gaining prominence, preparations for conventional conflict must not be neglected. Major defence procurement decisions must be made quickly. The army is still without towed and self-propelled 155mm howitzers for the plains and the mountains and urgently needs new utility helicopters, anti-tank guided missiles (ATGMs) as also weapons and equipment for counter-insurgency operations. The navy has had to wait long for the Vikramaditya (Admiral Gorshkov) aircraft carrier, which has been refurbished in a Russian shipyard at exorbitant cost and with operationally unacceptable time overruns. Construction of the indigenous air defence ship has also been delayed. The plan of the air force to acquire 126 multi-mission, medium-range combat aircraft in order to maintain its edge over the regional air forces is stuck in the procurement quagmire, even as the indigenous LCA project continues to lag inordinately behind schedule. All three Services need a large number of light and medium lift helicopters. India's nuclear forces require the Agni-III missile and nuclear-powered submarines with suitable ballistic missiles to acquire genuine deterrent capability. The armed forces do not have a truly integrated C4I2SR system for network-centric warfare, which will allow them to synergise combat capabilities. The approach followed is still a platform-centric one despite the demonstrated advantages of switching to a network-centric approach.

All of these high-priority acquisitions will require extensive budgetary support. With the defence budget languishing at less than 2.0 per cent of India's GDP compared with China's 3.5 per cent and Pakistan's 4.5 per cent plus US military aid – it will not be possible for the armed forces to undertake any meaningful modernisation. The funds available on capital account at present are inadequate to suffice even for the replacement of obsolete weapons systems and obsolescent equipment that are still in

service well beyond their useful life cycles. The Central Police and Para-Military Forces (CPMFs) also need to be modernised and better trained as they are facing increasingly greater threats while continuing to be equipped with sub-standard weapons.

The government must also immediately appoint a Chief of Defence Staff (CDS) or a permanent Chairman of the Chiefs of Staff Committee to provide single-point advice to the CCS on military matters. Any further dithering on this key structural reform in higher defence management on the grounds of the lack of political consensus, and the inability of the armed forces to agree on the issue will be extremely detrimental to India's interests in the light of the dangerous developments taking place in India's neighbourhood. The logical next step would be to constitute tri-Service integrated theatre commands to synergise the capabilities of individual Services. International experience shows that such reform has to be imposed from the top down and can never work if the government keeps waiting for it to come from the bottom up.

The softer issues that do not impinge immediately on planning and preparation for meeting national security challenges must never be ignored, as these can have adverse repercussions on the morale of the officers and men in uniform in the long term. Numerous anomalies created by the implementation of the Sixth Pay Commission report must be speedily resolved. In fact, the ham-handed handling of this issue has led to a dangerous "them versus us" civil-military divide and the political leadership must make it a point to bridge this gap quickly.

The ex-Servicemen too have had a raw deal and have been surrendering their medals and holding fasts to get justice for their legitimate demand of "one rank-one pension". One rank-one pension is an idea whose time has come and it must be implemented without further delay and without appointing any more committees of bureaucrats to look into the issue. While a Department of Ex-servicemen's Welfare has been created in the Ministry of Defence (MoD) in keeping with the UPA's Common Minimum Programme, till recently there wasn't a single ex-Serviceman in it. Such measures do not generate confidence among serving soldiers and retired veterans in the civilian leadership. Finally, rather unbelievably, India is still without a National War Memorial.

BRIGADIER (RETD.) GURMEET KANWAL

Adjunct Fellow, CSIS, Washington, D.C.

Brigadier (Retd.) Gurmeet Kanwal is a Delhi-based Adjunct Fellow at the Centre for Strategic and International Studies (CSIS), Wadhwani Chair, Washington, D.C. Before this, he was Director, Centre for Land Warfare Studies (CLAWS), New Delhi (January 2008–March 2012), the Indian Army's think tank.

Brig Kanwal commanded an infantry brigade in the high-altitude Gurez Sector on the Line of Control with Pakistan (Operation Parakram, 2001-03) in northern Kashmir and an artillery regiment in counter-insurgency operations in Kashmir Valley (Operation Rakshak, 1993-94). He has served as Deputy Assistant Chief of Integrated Defence Staff (Doctrine, Organisation and Training) at HQ Integrated Defence Staff, New Delhi; Director MO-5 in the Directorate General of Military Operations at Army Headquarters (dealing with threat, strategy and force structure); United Nations Military Observer in UNTAG, Namibia; Brigade Major of an infantry brigade and, as an Instructor-in-Gunnery at the School of Artillery, Devlali.

He opted for voluntary retirement in 2003 and joined the Observer Research Foundation (ORF), New Delhi, as Director, Security Studies and Senior Fellow. He has also served as Senior Fellow, Institute for Defence Studies and Analyses (IDSA), New Delhi; Senior Fellow, Centre for Air Power Studies, New Delhi and Visiting Research Scholar at the Cooperative Monitoring Centre (CMC), Sandia National Laboratories, Albuquerque, USA.

Brigadier Kanwal has authored several books: "*Nuclear Defence: Shaping the Arsenal*"; "*Indian Army: Vision 2020*"; "*Pakistan's Proxy War*"; "*Heroes of Kargil*"; "*Kargil '99: Blood, Guts and Firepower*" and, "*Artillery: Honour and Glory*". He has also edited many books.

He has contributed extensively to various journals of repute as well as leading national newspapers. He wrote a column on national security for the *Statesman* for over two years. He is a regular speaker at well known international think tanks and military institutions. He is also a keen photographer and has published a large number of photographs. His post-graduate qualifications include M Sc. (Defence Studies) and M Phil. (Strategic Studies and Management). E-mail ID: gurmeetHYPERLINK "mailto:kanwal@gmail.com" kanwal@gmail.com

China-India
Security Dimension

Air Vice Marshal (Retd.) Manmohan Bahadur

India and China are ancient civilizations and trace their recorded history to many millennia. In fact, the earliest recording about India in Chinese literature is in the form of travel records and writings of ancient Chinese travellers starting with Fa Hien or Faxian, who was the first Chinese monk to travel to India between 399 CE and 414 CE in search of Buddhist scriptures. He was followed by Hsuan Tsang between 629 CE and 645 CE who also visited Buddhist religious places to procure original Buddhist works.[1] Both left behind detailed accounts of their travel and the Indian way of life that they saw. However, intimate dealings and cross pollination of cultures and the way of life was inhibited due the presence of a Himalayan barrier between peoples of the two countries. The eighteenth and the nineteenth centuries were dark periods of history for both nations, something which the Chinese term as the centuries of humiliation.

These two Asian nations, giants in their own right, are now being looked at as major adversaries, and whose future interaction is viewed as being fraught with high chances of conflict in the future.[2] Being nuclear powers and countries whose relationship will define the way in which the politics of other countries in the region would be aligned, an analysis of the security facet of the relationship is important to arrive at a clear idea of what are the strategic dimensions of the India China relationship.

Why is a rising China seen as a threat by most Indians? In fact, many question whether the professed "peaceful rise" can be anything but peaceful, given the increasing Chinese nationalism that is being witnessed

in that country. The issue, for India, has many strategic dimensions, which this article shall study. First, its claim has a bearing on the territorial integrity of India. With the furious modernization of its armed forces, backed by an opaque military budget supported by huge financial outlays, the image projected to the world is that of a threatening dragon moving with a marauding gait to back its territorial claims. Second, China is seen as a country that is trying to make India irrelevant in global affairs, by treating it as one of the many other nations in Asia and giving it a standing of relative inconsequential importance. Third, China is viewed as an expansionist power which, by the rapid upgradation of its infrastructure in Tibet and its forays in the Indian Ocean region (IOR), is seen to be surrounding India with an inimical environment. Lastly, the economic dimensions of China's stupendous rise to power threaten India's economic well being with a skewed balance of payment realities. Thus, there are military dimensions, internal security issues and a not insignificant economic perspective to the India-China equation.

MILITARY DIMENSION

Chinese strategic culture is based on what Andrew Scobell a noted China specialist calls, "a cult of defence". It is based on an amalgamation of Confucianism and realpolitik. Confucianism confers on the Chinese thinking a culture of wanting peace in all situations, or a pacifist mindset (as per the Chinese). However, as per Scobell, a contrarian element is the presence of four key strategic constants that justify the use of military force, "the concepts of just war, the value placed on national unification, the principle of active defence, and high threat sensitivity".[3] Thus, offensive action to ensure defence is, as per the Chinese, a defensive step; as Scobell puts it, "the impact of the Cult of Defence is a predisposition by Chinese elites to opt for force because they perceive its use by China as always defensive in nature".[4]

America and Japan are viewed as primary threats by China. They view India's place a rung below theirs, and feel that it is a competitor in the long run. India is seen as having hegemonic tendencies but not having the power to accomplish them.[5] India's strategic culture is viewed as being belligerent and India itself as a South Asia bully and an expansionist nation; India's wars with Pakistan, role in the creation of Bangladesh and interventions in Sikkim, Maldives and Sri Lanka are quoted as examples of its expansionist culture. The recognition by India of Tibet being a part

of China notwithstanding, the grant of asylum to the Dalai Lama is the biggest cause of Chinese hostility. As an American study on Indo-China security relations concludes, ". . . their relationship is coloured by a mutual mistrust greater than the sum total of these specific disagreements".[6] Most experts interviewed for the study believed that the future bilateral relationship would be characterized by intense strategic, economic, and diplomatic competition, both bilaterally and regionally.[7] Thus, the ground realities are quite complex and both countries would keep a wary eye on each other, even if the boundary issues were to be solved.

Where do these analyses, which have taken historical facts and behaviour into account, place the agreements signed during the recent visit of Dr Manmohan Singh to China? Only time will tell whether the professions of peace made by China in the "Border Defence Cooperation Agreement" to not use or threaten to use force "in any face-off on the Line of Actual Control (LAC) and prevent exchange of fire or an armed conflict" will hold the test of time. Meanwhile, the opening of an "all weather" road to Medog, bordering Arunachal Pradesh, after seven failed attempts and USD 155 million shows the Chinese determination of stamping its presence in the regions bordering India.[8]

The "image" in the contemporary strategic discourse about China is heavily influenced by its military budget which has risen many fold during the past four decades. An April 2013 fact sheet of SIPRI brought out that China's military expenditure increased by 7.8 per cent in real terms to US\$ 166 billion in 2012.[9] Its military expenditure rose by 175 per cent in real terms between 2003 and 2012. Other Asian countries with notable increases in military spending during the period 2003–12 were Vietnam (130 per cent) and Indonesia (73 per cent). While SIPRI's reasoning for such large increases (basically in naval equipment) for Vietnam is the perceived threat from, "China's increasing military assertiveness in the South China Sea", the motivation for Indonesia has been stated as its military modernization programme to, "control its vast territory and territorial waters". India, in contrast, cut military spending in 2012 despite ongoing tensions on the China–India border. India's defence budget has decreased continuously over the past few years to a low of 1.9 per cent of GDP in the year 2012–13.

While the continuous increase in China's defence budget is a cause for worry, more importantly, the qualitative jumps in Chinese defence industry in general and its aerospace segment in particular, has to be factored-in, in any assessment. The Chinese defence industry has advanced

by leaps and bounds and with it moving from reverse engineering to major modifications and indigenous development of armament with critical technologies, the day is not far when it would move into the realm of original innovations, euphemistically being termed as "disruptive technology". Thus, from an air force point of view, China has a vibrant industry that is moving fast to reverse the lop-sided legacy versus modern systems ratio in its inventory. It has been exporting sophisticated arms and equipment to many nations, especially in India's neighbourhood, which brings with it additional leverage that it can exert to its advantage. Equally worrisome is China's march into space and the cyber environment. While it's 2007 ASAT test is still fresh in military memories, its move to construct a permanent independent space station and setting up of the Beidou satellite constellation for terrestrial navigation, are clear indicators of its resolute move towards using space for offensive military purposes, both on earth and in space as well. In 2012 it conducted 18 space launches and expanded its space-based ISR, navigation, meteorological, and communications satellite constellations. An American DoD report quoted by SIPRI states that China has a multi-dimensional program. ". . . to improve its capabilities to limit or prevent the use of space-based assets by adversaries during times of crisis or conflict."[10] By 2014 the regional coverage of the Beidou navigation satellite constellation would be in position, and by 2020 it would have worldwide coverage, thus making it capable of fielding long range weapons over land and sea, both conventional and nuclear, guided accurately by its own satellites.

While modernizing, the PLA has been continuously reducing its manpower in all the services since the 1980s as a result of its drive to phase out obsolete equipment and bring in modern systems. This conforms to its assessment that future wars that China would fight would be "local war under conditions of informationization".[11] An important indicator of this is the change in the composition of its Second Artillery Force. In 1985, 100 per cent of the SAF's missile force could reach Guam, located in the second island chain. In 2012, the composition of the SAF is such that only roughly 15 per cent of the SAF's capabilities can hit Guam. "This change indicates a significant shift in priorities from the second island chain and beyond to China's immediate periphery. Such a shift is fully in line with the local wars concept."[12] It is also an indicator of the improved accuracies that have been achieved by the Short Range Ballistic Missile (SRBM) fleet of the SAF, and the confidence levels of the Chinese in the deterrent value of their short and long range missiles. The analysis has

a significant message for India with regard to the usage of SRBMs fired from the Tibetan Autonomous Region to cripple India's northern airfields and infrastructure, something which would be of interest to Pakistan too.

Pakistan serves as a good third party to serve China's interests. In the American study quoted earlier, the authors wrote that, "China's good relations with Pakistan and Pakistani tensions with India continue to provide Beijing with a potentially effective source of leverage that it could exploit against Delhi. Despite the improvements in Sino-Indian relations over the past decade, some Chinese analysts still characterize Pakistan's geostrategic value to China *in surprisingly blunt language* (emphasis added). They assert that China could make effective use of Pakistani-Indian tensions as a trump card against Delhi in the event of another Sino-India border conflict, or if India were to threaten China's security interests near Malacca." This is as Machiavellian as it can ever get, and is a situation that cannot be easily wished away due to the deep ingratiation of Pakistan and its interests with Chinese polity. Additionally, Pakistan has a deeper utility value for China as it helps in assisting China in its "Uighur Muslim" problem; it also helps protect its interests in the Muslim world, and is being looked as a land gateway to the Persian Gulf through a land-link to Gwadar port.[13]

ISOLATE INDIA

The second strategic issue confronting India is the attempt by China to treat it as an unequal and relegate it to secondary importance in its foreign policy.[14] By doing this, China aims to hyphenate India with other smaller and unimportant countries, thereby casting it and projecting it as not worthy of immediate interest. Some analysts see this as the Chinese enactment of the famous Liddell Hart strategy of "indirect approach" to bottle up India in disputes with other nations, or threats emanating from them, thus keeping it pre-occupied. The obvious hyphenation is with Pakistan, but China is extending it to other areas too. Indian leadership's wise "look East" policy is seen with suspicion by China. Veiled and not so discreet attempts have been made to dissuade it from venturing into what China considers its backyard, as was done when ONGC's oil exploration in the South China Sea along with the Vietnamese led to the issue of a Chinese statement asking other "non-regional" nations not to interfere.[15] China has also been critical of the Indian Navy's increased forays in the South China and East China Seas. As Harsh V. Pant who lectures at

King's College London puts it, "At stake is Chinese opposition to India's claim to be a regional power."[16] If it succeeds, then China would meet its aim of having no peer or a near competitor in its rise to power. India, on its part, has to ensure that its focus does not get diverted from its primary aim of uplifting the economic standards of its masses; a war, or an inimical environment that thrusts an arms race on it will defeat the larger aim. Thus, a fine balancing act in this aspect is the need of the hour, even as it builds up its strategic relations with the US. In this context, it becomes important to note that in the October 2013 visit to China of the Indian Prime Minister, the two leaders also agreed, as Dr. Manmohan Singh put it, that "as large neighbours following independent foreign policies, the relationships pursued by India and China with other countries must not become a source of concern for each other. This will be our strategic reassurance". For India, this is with reference to China's strategic ties with Pakistan, while China's main concern would be India's ties with the United States.[17] Soothing to the ears it may sound, but in the diplomatic power game, one has to keep all options open, as China continues its efforts to encircle India with an environment that would keep it engaged with security concerns.

SURROUND INDIA

The third strategic dimension in India-China relations is to physically surround India with bases and states inimical to it. This is being done in a very coordinated manner by using the economic power of the modern Chinese state to buy influence through economic and diplomatic overtures, as well as by sheer physical presence. The Chinese strategy starts with using Tibet. Tibet has a chequered history, with its suzerainty shifting between its own indigenous Lamas and the dynasty in control of China. In the nineteenth century it became a pawn in the "Great Game" of Britain, China and Russia. The first hints of Chinese action to oppose British attempts to get an agreement on the status of Tibet were noted in various parleys held at Simla in 1913–14 where, after sending a representative to the talks, they did not sign the pact, which by default became bi-lateral in nature between British India and Tibet; the India claim that it is not so, as Chinese representatives were present for the talks, but China does not accept that agreement as its reps did not sign it. The accounts of those times are torturous in detail and interpretation (depending on who is doing the rendition), but the fact is that thereafter, till 1 October 1949

when the Peoples Republic of China officially came into being, there was no claim from the Chinese on Tibet, which had seen relative peace and had actually been functioning as an independent entity.[18] The devolution of the borders in the East was along the McMahon Line, and after the State of J&K acceded to India on 26 October 1947, the northern borders of the state became the responsibility of newly independent India.[19] The indication of Chinese hostility to India starts with the a string of claims, originating in the 1950s and Indian responses culminating with the first armed clash on 25 August 1959 at Longju in NEFA, followed by another in the Northern Sector in Ladakh at Hot Springs on 21 October 1959 in which nine CRPF jawans were killed (the day is commemorated as Police Day). How prescient was Sardar Vallabh Bhai Patel when he wrote to Prime Minister Nehru on 7 November 1950 that:

> . . . In the background of this (Chinese troops moving into Tibet in 1949), we have to consider what new situation now faces us as a result of the disappearance of Tibet, as we knew it, and the expansion of China almost up to our gates. Throughout history we have seldom been worried about our north-east frontier. The Himalayas have been regarded as an impenetrable barrier against any threat from the north. We had a friendly Tibet which gave us no trouble. The Chinese were divided. They had their own domestic problems and never bothered us about frontiers. In 1914, we entered into a convention with Tibet which was not endorsed by the Chinese. We seem to have regarded Tibetan autonomy as extending to independent treaty relationship. Presumably, all that we required was Chinese counter-signature. The Chinese interpretation of suzerainty seems to be different. We can, therefore, safely assume that very soon they will disown all the stipulations which Tibet has entered into with us in the past. That throws into the melting pot all frontier and commercial settlements with Tibet on which we have been functioning and acting during the last half a century.[20]

So, as in any boundary dispute, there are two conflicting positions, and in the modern world, it would require politicians to come up with a political solution. The India-China boundary dispute is particularly intractable due the involvement of treaties entered into by a colonial entity devolving down to successor governments; but there has to be an accord to end this discord, as China pinpricks India at sensitive moments and is keeping the embers smouldering, to be fanned at the time of its choosing.

The propensity of China to keep India guessing about the next move has taken on a different hue from just a "northern border problem", to an all round one with its encircling of India through a "string of pearls" presence in the seas on its southern flanks. Thus, with bases or ports it innovatively calls "support bases" in Myanmar, Bangladesh, Sri Lanka, Seychelles. Maldives, Mauritius among others, and now Gwadar in Pakistan, China's presence in our own backwaters has become disconcerting. India has done well in opening up to Myanmar almost a decade ago, the results of which are bearing fruit now, as well as engaging Japan, Vietnam, South Korea and Malaysia in an economic and security structured ambit. This has carried the challenge back to the Chinese, with India's firmness in continuing with oil exploration off the Vietnamese coast in the South China Sea making our intent loud and clear. Increased naval exercises with some of these countries have sent a message that India would contest any hindrances or obstacles that create obstactes for free navigational access in international waters. The last word, however, has still not been spoken on this issue as China continues to flex its muscles by adding a blue water capability for its Navy with new assets, including an aircraft carrier. To show its new found confidence in maritime issues, it has not joined the international coalition for anti-piracy patrols, but has maintained an independent combat ship throughout the past two years off the African coast to escort Chinese flagged ships. All in all, India needs to be acutely wary of the coercive effect that China is instilling into its body politic with a larger than life deterrent image. India, however, has become a victim of coalition politics due to which the central government has had to kowtow to regional parochialism as seen in the non culmination of the Indo-Bangla agreement on Teesta waters because of opposition from West Bengal and in the South where Sri Lankan trainee personnel were sent back from Tamil Nadu bases of the services. In the event, Sri Lankan officers sent back from the Defence Services Staff College at Wellington were accepted almost immediately by Pakistan's Staff College.[21] The loss of goodwill and anti-Indian sentiment can well be imagined.

Economic Dimension

Despite the negative aspects of the Indo-China security situation in the bi-lateral arena, India-China interaction in the economic field has been a success story, but with a twist in the tail. Economic ties have been diversifying and strengthening at a steady clip, and bilateral trade has

grown from less than US$ 3 billion in 2000 to roughly US$ 66 billion in 2012 with some forecast it reaching US$ 100 billion by 2015. Although bilateral trade has seen impressive growth, there are serious worries about the country's widening trade deficit with China which was USD 20 bn in 2010, increasing to USD 27 bn in 2011 and USD 29 bn in the period January-October 2012. Another aspect is the type of exports that are going from India to China, and what China is exporting to India; while India's exports are basically raw materials like iron ore, cotton and copper, what it is importing are finished goods in the form of steel, heavy machinery, electronics, etc. When extremely low prices, some say artificially maintained, are added to the problem at hand, then the picture one gets is of the situation being akin to the British raj and the death of indigenous industry due to the mills of Birmingham. Though the picture is not that alarmist, it is sombre enough to have made the Indian PM flag this question during his recent October 2013 visit to China. Efforts to alleviate this deficit, primarily in the form of official pressure on China to open up its IT and pharmaceutical industries, have so far produced little results.

CONCLUSION

The broad picture that emerges is that while India and China have common views in multi-lateral fora dealing with areas of common interests like environment, WTO, etc., their bi-lateral relations are marked with keen competition and rivalry, characterised by power jostling and building up spheres of authority among nations in South and South East Asia. China is using its economic and military clout to acquire influence, and India is building on the common threat perception in smaller countries of a rising and belligerent dragon.

India has its task cut out. It can ill-afford to have a conflict with China, as the primary challenge for leadership is the economic betterment of its masses. Equally, it cannot afford to lower its guard to prevent a large gap building up in its defence preparedness, or a reduction in the diplomatic and economic influence that it exercises in its neighbourhood. It requires dexterity in leadership and governance, and a vision that is enlightened in matters of state if it has to stay relevant in the region as a power to reckon with.

NOTES

1. See http://www.storyofindia.com/Historic-Travels-Of-India1.html and http://www.ancientindia.co.uk/staff/resources/background/bg3/ (copyright The British Museum).

2. Andrew Scobell, "Cult of Defence and Great Power Dreams: The Influence of Strategic Culture on China's Relationship with India", in Michael R. Chambers (Ed.), *South Asia in 2020: Future Strategic Balances and Alliances* (Carlisle: Strategic Studies Institute, November 2002), p. 348. Scobell writes that, "While open conflict . . . is not pre-ordained . . . the analysis here is a sobering reminder of the simmering tensions present in their relations".

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6. Murray Scot Tanner et al., Distracted Antagonists, Wary Partners: China and India Assess their Security Relations, available at http://www.cna.org/research/2011/distracted-antagonists-wary-partners-china-india, accessed on 12 October 2013.

7. Ibid. The authors write that, "One Indian security analyst speculated that even if their bilateral issues could be resolved, the overall India-China relationship would still be characterized by fundamental suspicion. This suspicion is shaped by the two countries' sizes, proximity, and ill-defined borders; their troubled history; their conflicting sets of allies and adversaries; their competitive political systems; their ambitions for a bigger role in Asia and the developing world; and their assessments of future trends in their balance of power."

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14. Mick Ryan, "India–China in 2030: A Net Assessment of the Competition Between Two Rising Powers", He writes, *China continues to give India a low priority in its foreign relations. It does not take India seriously. Underlying this relaxed attitude towards India is China's confidence about Chinese capabilities and its low opinion of India's capabilities. The Chinese take pride in their economic reforms and the resulting dramatic growth; they look down on the Indians for their slower growth and continuing economic problems. The one exception is IT sector.* Available at http://www.defence.gov.au/adc/docs/Publications2012/01_India%20-%20China%20NA%20-%20Full%20Paper%20v16%20-%2015%20Dec%2011%20-%20final.pdf, accessed on 11 October 2013.

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Air Vice Marshal (Retd.) Manmohan Bahadur

Air Vice Marshal Manmohan Bahadur retired from the Indian Air Force after 36 years of distinguished service. He is an Experimental Test Pilot from the French Test Pilots School, a graduate of the Air Command and Staff College, USA and a post graduate in Defence and Strategic Studies from Madras University. He has commanded a frontline helicopter unit and two flying bases, was the Contingent Cdr of the first IAF United Nations Mission in Sudan and has been Head of Training (Air) at Defence Services Staff College, Wellington. As Asst Chief of Air Staff, the author was the operational head of transport and helicopter operations of the Indian Air Force for two and a half years. His last assignment was as Asst Chief of Integrated Defence Staff in-charge of perspective planning and force structure of the services. He writes for leading national newspapers and professional journals. His core interests concern Air Power and Strategic Affairs. AVM Bahadur is currently a Distinguished Fellow at the Centre for Air Power Studies, New Delhi.

Air Vice Marshal Manmohan Bahadur VM (Retd)
273, Suvidha Group Housing Society
Plot No 10 GH
Sector 56
Gurgaon 122011
E-mail: manmohanbahadur@yahoo.co.in

Higher Defence Management in India
Need for Drastic Overhaul

Shri Nitin A. Gokhale

> The Defence Secretary, with his nearness to the Defence Minister, often began to exercise power on the minister's behalf and was, quite often, regarded as the *de facto* Defence Minister. The "supremacy of the civil over the military" was thus effectively changed from the supremacy of political authority to that of the civilian bureaucracy.
>
> Writes former Army Chief S. Padmanabhan in his book,
> *A General Speaks* in 2005

General Padmanabhan is not the first military leader in independent India to lament this fact, nor is he likely to be the last given the way the higher defence management structure in the country has evolved since 1947. The civil-military relationship in the country post-independence is replete with episodes that suggest a constant state of tension between the "generalist" bureaucracy and the "specialists" military leaders, with the political executive watching, and sometimes encouraging the bureaucracy to keep the military under control.

The political executive, starting with India's first Prime Minister Jawaharlal Nehru, has generally excluded military leadership from the decision making process at the highest levels. Military leaders, be it the redoubtable Gen KS Thimayya in the late fifties, the mercurial Adm Vishnu Bhagwat just before the turn of the century, or the combative Gen V.K. Singh in 2012, have all lost out to "civilian" dominance despite their own towering personalities.

In his two part treatise titled *The Soldier and the State* and *India's Civilisational Flaw: Isolation of the Military*, Admiral Vishnu Bhagwat had tried to trace the origins of the working of the Ministry of Defence in independent India. In light of his subsequent dismissal less than two months after he released the two essays, many have wondered if the Admiral, known for high professional competence, had an inkling about his impending ouster, and was therefore putting it on record what he felt was wrong with India's higher defence management!

Much has been written and debated about the Admiral Bhagwat saga; his run in with the then Defence Minister George Fernandes, the machinations of the civilian bureaucracy in plotting the Navy Chief's abrupt ouster and its fallout on the already fraught civil-military relations. A stickler for rules, Admiral Bhagwat rubbed many powerful people the wrong way and paid the ultimate price.

Nearly a decade and a half later, South Block, the colonial era building that houses the Indian Prime Minister's Office as well as the Defence Ministry, was rocked by another face off between a military chief and the politico-bureaucratic combine. The mishandling of Gen V.K. Singh's "birth date" issue again starkly brought forth the fissures within the top hierarchy of the Indian Army, as well as between service headquarters and the civil bureaucracy in the Ministry of Defence.

The controversy over the Gen VK Singh issue in early 2012 degenerated into a public spat between the Ministry of Defence and the then Army Chief, once again forcing analysts to ask the question: Has civilian control of the military in India become synonymous with bureaucratic control?

The answer from military leaders is an unequivocal Yes.

Bureaucrats, officers of the elite Indian Administrative Service (IAS), never agree with this contention. They continue to maintain that all that the IAS does is to carry out orders of the political executive.

This, at best, is a half truth.

The political executive, barring a handful few, neither has the knowledge, nor any interest in matters military and therefore depends completely on inputs from the bureaucrats, who continue to mould the political leadership's thought processes according to their own perceptions on governance and administration.

Admiral Arun Prakash, former Chief of Naval Staff and a prolific commentator on national security affairs has this to say about the equation between the Ministry of Defence and Service Headquarters: "Two major factors have contributed to the systemic dysfunctionality that we see

in the management of national security affairs. First is the politician's detachment and indifference towards matters relating to national security, because this is not an issue that can win or lose votes. Since politicians have not considered it worthwhile establishing a close and cordial relations with the leadership of the armed forces, it is not surprising that when faced with a crisis or problem, politicians finds themselves at a complete loss. A related factor is the total reliance that the politician places, for advice, decision-making and problem resolution, on transient, generalist MoD civil servants, drawn from diverse backgrounds. This, despite the Chiefs and the highly specialized Service HQ (SHQ) staffs being at their disposal, for tendering advice in the management of national security."

The military leadership has always riled at this "imbalance" in the decision making structure at the highest levels, but has been unable to change the system so far. Adm. Vishnu Bhagwat, himself a victim of politico-bureaucratic machinations, wrote in his treatise *The Soldier and the State*: "By selective usage, omission and interpretation of language, it (civil services) has continuously imposed a variety of constraints, checks and curbs on the very functioning of the armed forces in general, and the business of service headquarters in particular. This has virtually isolated and marginalised the defence forces from all processes which go into formulation of national policies and agendas, even in the cardinal sphere of national security."

Before Independence, the status of the Commander in Chief (C-in-C) in India was second only to that of the Viceroy. As a member of the Viceroy's Executive Council, he was also the *de facto* Defence Minister. He was served by his uniformed Principal Staff Officers (PSOs) and the Defence Secretary who, incidentally, was below the PSOs in order of precedence. The role of the Defence Department was not to examine proposals, or to sit in judgement over Army Headquarters, but was restricted to issuing orders in the name of the Government of India.

In the interim government of the transitional period, a Defence Member was included in the Viceroy's Executive Council. Soon after independence, the War Department and the Department of Defence were merged to form the Ministry of Defence (MOD). It was then enlarged suitably to take on such other higher functions of defence management—threat assessment, force levels, budgeting, defence production and so on—which till then were attended to by the Service Headquarters in the United Kingdom.

Independence also necessitated creation of structures to establish

parliamentary control over the military. In 1947, a committee of three senior Indian Civil Service (ICS) officers had suggested structuring of the MOD on the lines of the Ministry of Home Affairs (MHA) and, in the process, had also aimed at lowering the standing of military officers, much in the same way as that of the police officers in relation to the ICS. It was Lord Mountbatten who ensured that the Service Chiefs retained their status higher than the Defence Secretary. Mountbatten's Chief of Staff Lord Ismay, not wanting to rock the boat in those turbulent times, suggested the formation of a high-level committee to look after service matters instead of ordering a radical restructuring.

In essence, the decision-making process was to have the benefit of independent inputs from the Chiefs of Staff Committee (COSC), the Defence Minister's Committee (Service Chiefs were members of this Committee) and the Defence Committee of the Cabinet. These in turn signified representation of the Services, and a mechanism for bureaucratic processing, and of course political control. The Service Chiefs interacted directly with the Cabinet through the Defence Cabinet Committee.

Sixty-six years after Independence, it is no secret that the political-military interface is all but absent in India's institutional set up. The armed forces are completely under the day-to-day as well as policy control of the MoD. The desirable politico-military interface is now reduced to weekly, sometimes fortnightly meetings chaired by the Defence Minister. According to several former chiefs this author has spoken to, these meetings are informal, without any agendas or note taking, and have no official status although in theory the Defence Minister is deemed to have given policy directions in these meetings!

The downhill journey began very early after Independence. It accelerated particularly during the Nehru-Krishna Menon period. Menon, a man with strong likes and dislikes, as Defence Minister, rode roughshod over the military and disregarded professional advice from military leadership. In 1959 Gen KS Thimayya, regarded as one of India's finest soldiers, who had a run in with Menon over a professional matter, resigned in protest, but Pandit Nehru manoeuvred the entire episode in such a way that it ended humiliating the highly respected general.

Inder Malhotra, veteran journalist describes the event thus: "S. Gopal (Nehru's biographer) perceived the Thimayya-Menon episode as "a comic-opera putsch". According to him, Nehru dealt with it in Parliament "in such a way as to strengthen Menon's position and shrink Thimayya's reputation. He stressed the importance of the government's control of the armed

forces and hinted that Thimayya had acted irresponsibly."[vii] Nehru and Menon may have won a temporary victory over the military, but in less than four years the nation paid the price of undue political meddling in professional military affairs in the form of a military debacle in the month long border clash with China in 1962.

Over the next decade, the military emerged out of the setback much stronger and delivered a most emphatic victory over Pakistan in 1971. The events leading to that famous victory and the creation of Bangladesh are too well known to recount here, but suffice it to say that the Indian military displayed absolute competence and professionalism in less than a decade after a massive defeat against China. That India as a nation failed to build on the 1971 triumph is one of the tragedies of modern times.

Through the seventies, eighties and the nineties, the bureaucracy continued to acquire disproportionate powers vis-à-vis the Service Chiefs, and now it's a given that the Defence Secretary and NOT the Service Chiefs, is the single-point adviser to the Cabinet on matters military. For he and the Cabinet Secretary have consistent interface with the political leadership, with the Service Chiefs attending the meetings of the Cabinet Committee on Security (CCS) only *if* invited.

The bureaucracy conveniently points to the "Government of India Transaction of Business Rules" (ToB Rules). Framed in 1961 under the constitutional powers of the President of India, these documents continue to guide the conduct of business by the Government of India.

It is instructive to read the document. Under these rules, the three service headquarters were designated as "Attached Offices of the Department of Defence", and are therefore placed in a position subordinate to the DoD. The Service Chiefs, as professional heads of the three armed forces and with experience garnered over a period of at least four decades, find no mention in these rules.

The Secretary, Department of Defence on the other hand, according to these rules, is responsible for Defence of India and every part thereof including preparation for defence and all such acts as may be conducive in times of war for its prosecution and after its termination for effective demobilisation. The Armed Forces of the Union, namely, the Army, Navy and Air Force, Integrated Headquarters of the Ministry of Defence comprise of Army Headquarters, Naval Headquarters, Air Headquarters and Defence Staff Headquarters.

So the Defence Secretary, a generalist IAS officer, and not the military brass, is responsible for national defence as well as conduct of war! Under

the current rules, the Service Chiefs have neither been accorded a status nor granted any powers in the government edifice. In the process, it is the Service Chiefs who have been marginalised from the decision-making bodies.

ATTEMPT TO REDRESS THE BALANCE

Following the Kargil conflict of 1999, the government appointed the Kargil Review Committee (KRC) under renowned strategic thinker and writer K Subrahmanyam. Its recommendations, among other vital issues, focussed on reorganisation of higher defence management. The KRC recommendations followed formation of a Group of Ministers (GoM). It set up four task forces on intelligence reforms, internal security, border management, and higher defence management to undertake an in-depth analysis of various facets of management of national security. After year-long deliberations the GoM, among other comments observed: "There is a marked difference in the perception and crisis of confidence among civil and military officials within the MOD and Services HQs regarding their respective roles and functions."

There was also lack of synchronisation among and between the three departments in the MOD, including the relevant elements of Defence Finance. The concept of "attached offices" as applicable to Service HQs; problems of inter-service relativities; multiple, duplicated, and complex procedures governing the exercise of administrative and financial powers, and the concept of "advice" to the Minister; all these had contributed to these problems.

Having identified the problem, the GoM, led by then Deputy Prime Minister LK Advani made many far-reaching recommendations. Some key points were:

- Creation of the post of Chief of Defence Staff (CDS), whose tasks was to include inter-services prioritization of defence plans and improvement in synergy among the three services.
- Creation of Headquarters Integrated Defence Staff (IDS).
- Formation of a tri-service Andaman and Nicobar Command and a Strategic Forces Command.
- Establishment of tri-service Defence Intelligence Agency (DIA).
- Creation of The National Technical Research Organization (NTRO) for gathering electronic and other technical intelligence.

More than a decade after these recommendations, many of the decisions with the exception of the most crucial one—that of the

appointment of a CDS—have been implemented. While there will be different opinions on the efficacy of many of the organisations such as HQ IDS, NTRO, DIA and the effectiveness of the Andaman Nicobar Command, the fact is the distrust between the military leadership and the civilian bureaucracy continues to be a major impediment in implementing this set of defence reforms. The CDS envisaged as a single-point military adviser continues to remain elusive, mainly because there is no political or military consensus and the bureaucracy is happy to play along.

Meanwhile civil-military relations continue to remain fraught. While very few have been able to explain the real reason behind the antipathy against the military displayed by the civil bureaucracy and the political executive, my experience suggests that non-military personnel perhaps resent the armed forces because of their evidently orderly and efficient ethos, the tightly bound camaraderie and distinct standing in society. And this is not unique to India. Renowned sociologist Morris Janowitz had famously said: "The intimate social solidarity of the military profession is both envied and resented by civilians."

So is there a way out of this logjam? Can the status quo ever be broken?

The government, worried over the increasing criticism over a lack of National Security Policy and half-hearted implementation of the 2001 GoM recommendations, appointed another high level committee under former Cabinet Secretary Naresh Chandra in 2011. Within a year, the high powered committee submitted its detailed report to the Prime Minister in mid-2012, but so far there is no indication that the report will be made public soon. We do not even know if within the government, deliberations have begun on the recommendations given by the Task Force. All that is available in the public domain so far is a glimpse of some key recommendations made by the task force that too through media reports, obviously based on conversations with some members of the task force. For instance, the task force has apparently recommended:

- Appointment of a Permanent Chairman, Chiefs of Staff Committee (CoSC)
- Integration of Service HQ and Ministry of Defence by allowing more cross-postings
- Shifting focus of India's national security strategy from Pakistan to China
- Better intelligence coordination between all agencies
- Creation of dedicated financial institution for access to energy, rare earths and raw materials from across the world

From some of the occasional interactions that this author has had with a few members of the Task Force, before and after the submission of the report, one aspect is very clear: There was no consensus on the creation of the post of the Chief of Defence Staff (CDS), leading to, what one believes, a half-hearted recommendation to appoint another four-star officer as permanent Chairman of the Chiefs of Staff Committee (CoSC).

According to the Task Force, this officer will be in charge of the two existing tri-services commands-the Strategic Command Force (SFC) and the Andaman Nicobar Command (ANC), while the three Service Chiefs will continue command and lead their respective services, the Task Force said.

The Permanent Chairman CoSC, according to the recommendation of the Naresh Chandra Task Force, will have a fixed tenure of two years and will be rotated among the three services. This officer will be assisted by the existing Integrated Defence Staff (IDS), headed by a three star officer from any of the three services. Over the past decade, the IDS has evolved in a barely workable tri-services structure with over 300 officers drawn from the three services trying to function as a cohesive unit tasked with evolving "jointness". On the ground however, jointness or inter-operability has remained at best patchy.

The new recommendation seeks to overcome these differences. The Naresh Chandra Task Force has also recommended the creation of a separate Special Operations Command on the lines of the US structure, since asymmetric threats are seen as the main challenge to India's national security in the coming decades.

However, critics of the new system say the recommendation to appoint Chairman CoSC is nothing but old wine in a new bottle. It is a "no go" because the Chairman will remain ever dependent on each of the services Army, Navy and IAF for its personnel requirements. Personnel of each service will be "lobbyists" of the respective Chiefs.

From what is known publicly, I would say yet another opportunity to reform has been lost. National Security System does not have to depend on seeking Least Common Multiple (LCM)-solutions. It does not have to seek to appease lobbies and turfs.

The solution, I believe lies in divesting the three Chiefs of operational command of forces. Let them be Chiefs of the respective staff – "resource providers to joint operational/strategic commands" – content with recruiting, training of personnel; holding and maintaining equipment; and executing related administrative functions.

In the absence of a common meeting ground on deciding to appoint a CDS, the Naresh Chandra Task Force recommendation can however be utilised in the interim in creating more cohesion among the services. For instance, the Chairman Chiefs of Staff Committee, who will have a fixed two year tenure can be made in charge of making net assessment about the strengths and weaknesses of India's adversaries—China and Pakistan—in a holistic manner, taking into consideration inputs from all the three services and cross-referencing those inputs with other agencies like the Defence Intelligence Agency (DIA) and RAW. Currently, the three services send their individual assessments just to complete formalities to the IDS, where it remains buried in files that never see the light of day.

Moreover, if the Chairman, Chiefs of Staff Committee is going to lead the proposed Special Operations Command why not create two more tri-services commands and give him some more work?

Given the frequency of cyber-attacks on India's IT infrastructure, creation of a cyber-command is only a matter of time. An aerospace command is inevitable sooner rather than later. Along with the creation of the proposed Special Operations Command, why not create these two additional tri-service commands? And let the Army, Air Force and Navy be the lead service for a particular command.

The proposed Chairman, Chiefs of Staff Committee can remain the head of these three commands, with each of them being led by an Army Commander level officer. Given the experience and expertise available with the Army, it can take charge of the Special Operations Command, the IAF, with its domain knowledge, can take over the aerospace command and the Navy can lead the cyber command. The heads of these commands can have their second rung manned by two-star officers from each of the services, so that they continue to have the benefit of expert advice from across the services, but the overall responsibility must remain with the designated service.

Given that the existing tri-services commands go through painful changes each time their Commanders-in-Chief get rotated, making each of the services responsible for the proposed new commands will make their working smoother and more efficient.

Over a decade after a CDS was recommended by the Group of Ministers (GoM) in the wake of the Kargil conflict, there is no unanimity on that issue yet. Given the strong differences within the services as well as in the political class, could this be the best arrangement for now? Or is it too impractical?

Historically, it is to the credit of the Indian armed forces that they have fulfilled their assigned role as an organ of the state…they have functioned effectively in every type of role, in spite of the general lack of a supportive government environment by way of adequate finances, resources, equipment, personnel policies, or higher political direction.

The government is however duty bound to take urgent steps to reform the higher defence management in the interests of the nation. As a first step, the government owes it to the people of India to make the Naresh Chandra Task Force report public and let a healthy debate ensue, if India has to overcome systemic weaknesses and structural shortcomings in its national security decision making apparatus.

SHRI NITIN A. GOKHALE

Shri Nitin A. Gokhale, currently NDTV's Security & Strategic Affairs Editor, is an authoritative defence analyst, author, media trainer and a multi-media reporter with more than 30 years experience across web, print and broadcast mediums.

Author of three books on insurgency, war and demography, he regularly teaches and lectures at India's National Defence College, the Army, Navy and Air Force War Colleges, Defence Services Staff College, the Indian Institute of Mass Communication, the Intelligence Bureau's Training School and the College of Defence Management.

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