

# AIR POWER

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# CONTENTS

Editor's Note	v
1. <b>PAKISTAN'S NON-TRADITIONAL SECURITY THREATS</b> <i>Tilak Devasher</i>	1
2. <b>INTEGRATED THEATRE COMMANDS: DOES THE IDEA SUIT INDIA?</b> <i>Ramesh Rai</i>	27
3. <b>INTEGRATED OPERATIONS: MORE THAN JOINTMANSHIP</b> <i>Ashminder Singh Bahal</i>	43
4. <b>COMBATING HYBRID THREATS: A HOLISTIC STRATEGY</b> <i>Arjun Subramaniam and Naishad Purohit</i>	65
5. <b>CYBER ASTUTENESS: AN ELUSIVE ENABLER OF MILITARY DOMINANCE</b> <i>Asheesh Shrivastava</i>	83
6. <b>THINKING STRATEGICALLY</b> <i>Ashish Singh</i>	109

CONTENTS

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7. **INDIA'S HYDROCARBON POLICY:  
DIVERSIFICATION, DIPLOMACY AND DEALS** 133  
*Sai Deepthi Pavani*
8. **EVOLUTION OF US POLICY ON CLIMATE CHANGE:  
FROM PRESIDENT OBAMA TO PRESIDENT TRUMP** 155  
*Ishka Yadav*

## EDITOR'S NOTE

As we approach the end of the year, it is a good time to look back at some of the major happenings during the year. The year started with the inauguration of President Trump and some uncertainty as to his approach to international relations. Very soon, he showed that he would introduce disruptive policies, and many countries are trying to adjust to a new USA. Other disruptive happenings include the election results in Germany and Britain. At the other end of the world, the 'dragon' was baring its economic and military fangs. China's rise, its brinkmanship and use of economic power are impacting the policies of many regional countries. President Xi Jinping's continued rise to a position of near absolute pre-eminence has many countries somewhat worried. How can China be contained is a refrain often heard in policy circles. It is in India's interest to have good relations with China but the Doklam standoff and the vituperative language used during the period is not a good augury. In short, it is unfortunate that the year is ending on a less happy note and we can but hope that 2018 will bring happier tidings.

As usual, this issue of the *Journal* has articles covering different themes. We start with **Tilak Devasher** expounding on Pakistan's non-traditional security threats. Much has been written and discussed about Pakistan's insecurities; the power exercised by its Army; and the impact of US and Chinese initiatives on its polity. Also often mentioned is that Pakistan is a haven for terrorists, and their nuisance value for India. Tilak takes a different tack and examines the internal insecurities in Pakistan that are non-military and non-political. He discusses four major problem areas for Pakistan viz Water, Economy, Education and Population; the acronym WEEP is, indeed,

appropriate. The article is a condensed version of his book *Pakistan: Courting the Abyss* and one wonders why Pakistan is not taking steps to arrest a fast deteriorating situation. It is fairly certain that on reading the article, the reader will reach for the book.

Reorganisation of our higher defence organisation into integrated Theatre Commands continues to exercise our minds. In a far-reaching article, **Air Mshl Ramesh Rai** argues that such organisations have little relevance in our context. Our approach to warfare is insular and we do not envisage our using expeditionary forces in far off lands. He recounts a telling statistic, saying that in World War II, the entire geographical space where war was fought measured 98 million sq km and there were two Theatre Commands: the European Command and the Pacific Command. Our entire geographical area is only 3.3 million sq km and should be viewed as a single theatre. Moreover, our force levels are small and we do not have the luxury of sharing poverty. Often, concentration of force is needed and parceling out of the force is not recommended. The author also quotes examples from military history and the employment of air power. His suggestion that we should concentrate on joint planning is compelling.

The next article is a study on integrated operations by **Air Cmde Ashminder Singh Bahl**. He gives a good definition of jointmanship and argues that it is different from integration. The author is an experienced pilot with a professional approach and this is evident in a largely theoretical construct. He discusses the concept of war, the future battlefields, and how technology has spawned the idea of a faceless enemy. Again, he discusses the import of comprehensive security and the yardsticks to judge success in war. He is also brave enough to advance prescriptions, including the need for understanding concepts, and training in the new form of warfare. The article is well written, well argued and makes for good reading.

Military writings now discuss 'hybrid warfare' at length. Is it something novel or merely old wine in new bottles? After all, all wars have attempted to take advantage and score over the adversary using whatever means are most suitable and they need not be the use of the military alone. Hybrid

warfare encompasses many levels of warfare in a coordinated manner. Now that this type of war has been anointed with a specific terminology, it behoves us to study and imbibe the understanding and planning for it. **Air Vice Mshl Arjun Subramaniam** and **Sqn Ldr Naishad Purohit** have co-authored an article that should interest the average reader of this *Journal*.

It is generally believed that cyber activities will play a part in any future war and may take the lead to start the war. **Wg Cdr Asheesh Shrivastava** suggests that the virtual domain is the new battlefield and cyber capability is increasingly becoming a significant force multiplier. It is true that every major improvement in communication technology leads to the birth of more effective means of cyber interference. A cyber war will be less expensive but could cause considerable nuisance or more. The author touches on some historical references and mentions the technological advances taking place and those in the offing. He also suggests means to combat the menace.

Some foreign authors have questioned our strategic thinking and some have categorically asserted that we are short of strategic thought. Some disparaging terms have also been used. The thinking is indeed erroneous as our history boasts of many examples of a strategic culture. Undoubtedly, individual thinking is tempered by perceptions, compulsions and peccadilloes. In a well thought through article **Gp Capt Ashish Singh** takes a holistic view and argues that the differentiation between tactics and strategy is misplaced. Strategic thought is needed even for tactical actions. The author delves into theory but his experience as a combat pilot is all too obvious. The article makes one reconsider embedded thoughts and ideas. The author intends to write a sequel and our readers will eagerly look forward to reading more on the subject.

The last two articles comprise the work of two young scholars who interned with us at the Centre for Air Power Studies (CAPS). We are proud to publish their work. **Sai Deepthi Paveni** writes on India's hydrocarbon policy and **Ishka Yadav** looks at the evolution of US policy on climate

EDITOR'S NOTE

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change. Both subjects are of contemporary relevance and both authors address the subjects in some detail. The authors are mature beyond their years and our readers will appreciate how the thoughts have been well formulated and the conclusions drawn are both cogent and acceptable.

I wish all our readers a Happy New Year.

Happy reading.

A handwritten signature in black ink, appearing to be 'H. Katz', written in a cursive style.

# PAKISTAN'S NON-TRADITIONAL SECURITY THREATS

TILAK DEVASHER

Traditional analysis of Pakistan's security threats begins with its geographical construct: a flat terrain coupled with several of its population centres being close to the border with India. Even before the creation of Pakistan, the Cabinet Mission Plan of May 16, 1946, had stated clearly: "The two sections of the suggested Pakistan contain the two most vulnerable frontiers in India and for a successful defence in depth, the area of Pakistan would be insufficient."<sup>1</sup>

Post-creation, Ayub Khan was perhaps the first to articulate the lack of depth of Pakistan. He wrote in his diary on October 10, 1968: "The Chinese keep talking to us in terms of guerilla warfare because that is their experience, besides they have the space for this. Unfortunately, we lack depth in our country and, besides, some of our centres of population, communication links, headworks and canals lie near the borders, so we have to be ready to defeat the enemy as soon as he enters our territory. This is what we did last time and we have every hope of success should he aggress again."<sup>2</sup>

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Mr. **Tilak Devasher** is the author of *Pakistan: Courting the Abyss* published in December 2016 by Harper Collins India. He is a former Special Secretary, Cabinet Secretariat, Government of India.

1. Statement by the Cabinet Delegation and His Excellency the Viceroy (as issued in New Delhi on May 16, 1946), <http://www.bl.uk/reshelp/findhelpregion/asia/india/indianindependence/transfer/transfer2/>. Accessed on September 24, 2017.
2. Craig Baxter, ed., *Diaries of Field Marshal Mohammed Ayub Khan, 1966–72* (Karachi: OUP, 2007), p. 271.



**These non-traditional threats actually go to the heart of what is going wrong with Pakistan. With a comprehension of such threats, it would be easier to understand where Pakistan is headed and what threats it could pose to us in the future, in addition to the traditional military and terrorist threats that it poses.**

As a consequence, Pakistan has always seen its security primarily in military terms. Analysts have pitched in with articulation of its nuclear arsenal, conventional military capability and its use of non-state actors as force multipliers. Articles in many journals also do a missile for missile, tank for tank, division for division, aircraft for aircraft and ship for ship comparison between India and Pakistan. What gets neglected in such analyses is a critical element of the power matrix that comes under the rubric of Non-Traditional Security Threats (NTSTs).

More contemporarily, there has been a shift away from the exclusive stress on territorial security seen in military terms to include NTSTs that encompass all threats dealing with human security or the well-being of the citizens of a country. They include issues like (a) energy, food and water security; (b) economic security; (c) environmental security; and (d) societal security.

These non-traditional threats actually go to the heart of what is going wrong with Pakistan. With a comprehension of such threats, it would be easier to understand where Pakistan is headed and what threats it could pose to us in the future, in addition to the traditional military and terrorist threats that it poses.

This article focusses on four areas of Pakistan's NTSTs that are collectively called the WEEP factors. These are Water, Education, Economy and Population.<sup>3</sup> In addition, some environmental issues are also touched upon.

## **WATER**

Pakistan is an arid country but an agro-based one, where 60 percent of the population depends on agriculture for their livelihood, especially in the dominant province of Punjab. Agriculture accounts for about 20

3. A detailed coverage of these issues can be found in the author's *Pakistan: Courting the Abyss*, published by Harper Collins India in December 2016. The discussion in the succeeding paragraphs is largely based on a section of the book.

percent of the Gross Domestic Product (GDP) and over 70 percent of Pakistan's exports depend on agriculture-based products. Not surprisingly, therefore, up to 95 percent of all water—surface and ground water—is utilised in irrigation for agriculture.<sup>4</sup>

- **Water Availability:** The total average annual availability of water in Pakistan is estimated at 200 MAF (Million Acre Feet), of which 145 MAF is surface water

and 55 MAF is ground water. However, the per capita availability of water decreased from 5,650 cubic metres (m<sup>3</sup>) per year in 1951, when its population was 32.5 million and it was a water-abundant country, to roughly 940 m<sup>3</sup>/per capita/year in 2015<sup>5</sup>, when its population was estimated to be 194.5 million. Currently, the per capita availability is estimated at 908 m<sup>3</sup>/ per capita/year.<sup>6</sup> It is estimated that by 2025, water availability would have shrunk to 855 m<sup>3</sup>/per capita/year<sup>7</sup>, when its population could increase to 220 million. The country is expected to become absolute water scarce – less than 500 m<sup>3</sup>/per capita/year– by 2035,<sup>8</sup> though some analysts and organisations like the Pakistan Council for Research in Water Resources (PCRWR) even predict this by 2025

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4. Daniya Khalid, "Pakistan's National Water Policy", *The Express Tribune*, July 29, 2017, <https://tribune.com.pk/story/1469030/pakistans-national-water-policy/>. Accessed on September 27, 2017.
  5. Mushtaq Ahmed, "Water Saga", *The Nation*, May 31, 2016, <http://nation.com.pk/columns/31-May-2016/water-saga>. Accessed on September 27, 2017.
  6. "Water Scarcity Looming Large in Pakistan: Report", *The Nation*, August 21, 2017, <http://nation.com.pk/national/21-Aug-2017/water-scarcity-looming-large-in-pakistan>
  7. "Water Wars", editorial, *The News*, February 17, 2015, <https://www.thenews.com.pk/print/24547-water-wars>. Accessed on September 27, 2017.
  8. An area is said to be experiencing water stress when its annual water supplies fall below 1,700 m<sup>3</sup> per capita; water scarcity when supplies fall below 1,000 m<sup>3</sup> per capita, and there is absolute water scarcity when supplies drop below 500 m<sup>3</sup> per capita a year. Zaigham Habib, "Water Worries", *The Friday Times*, April 24–30, 2015.

i.e eight years from now.<sup>9</sup> Incidentally, absolute water scarcity means drought-like conditions in parts of the country.

- **Indus:** Pakistan is dependent on just one river system – the Indus—and ground water for its water needs. The peculiarity of the Indus is that 75 percent of its flows occur during four summer months, and 25 percent during the rest of the year. The problem, however, is that the water demand is 60 percent in summer and 40 percent in winter. This necessitates sufficient water storage during the short surplus period for use during the longer water stress period.<sup>10</sup>
- **Water Storage:** Pakistan has built only three major storage facilities : Mangla (1967-Jhelum), Tarbela (1976- Indus) and the Chashma Barrage (Indus). When constructed, they had a total live storage of 15.73 MAF.<sup>11</sup> This capacity is inadequate to store the water available during the summer months. In fact, Pakistan can store only 30 days' supply<sup>12</sup> or 150 m<sup>3</sup> per capita per year. The international standard is 120 days.<sup>13</sup> Without adequate storage, 30 MAF of water in the Indus in the surplus months flows to the sea. To put it in perspective, this is equivalent to more than the entire water of the Chenab river. Moreover, due to silting, it is estimated that the storage capacity of around 8.37 MAF will be lost by 2025. Even now, the Tarbela and Mangla Dams have been reaching dead-levels earlier.<sup>14</sup>

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9. "Pakistan Could Face Mass Droughts by 2025: PCRWR", *Express Tribune*, September 16, 2017, <https://tribune.com.pk/story/1508063/pakistan-face-mass-droughts-2025-pcrwr/> Accessed on September 26, 2017.

10. Habib, n. 8.

11. "The Indus Equation", Strategic Foresight Group, Mumbai, 2011, [http://www.strategicforesight.com/publication\\_pdf/10345110617.pdf](http://www.strategicforesight.com/publication_pdf/10345110617.pdf). Accessed on September 27, 2017.

12. Simi Kamal, "Pakistan's Water Challenges: Entitlement, Access, Efficiency, and Equity," in Michael Kugelman and Robert M. Hathaway, eds., *Running on Empty: Pakistan's Water Crisis* (Washington DC: Woodrow Wilson International Center for Scholars, 2009), pp. 28–44.

13. "Looming Water Crisis", editorial, *Daily Times*, June 12, 2015, <http://www.dailytimes.com.pk/editorial/12-Jun-2015/looming-water-crisis>. Accessed on September 26, 2017. However, addressing a two-day international conference on "Regulation of Hydraulic Structure for Flood Management" arranged by the Global Water Partnership in June 2013, the minister of planning asserted that this had fallen to eighteen days due to losing 4.6 MAF of live storage in the existing reservoirs because of sedimentation. "Per capita Water Availability Alarming: Minister", *The News*, June 29, 2013, [http://unesco.org.pk/ns/documents/2013/fms/pc\\_The-News.pdf](http://unesco.org.pk/ns/documents/2013/fms/pc_The-News.pdf). Accessed on September 27, 2017.

14. Sehrish Wasif, "Water Levels at Mangla, Tarbela at Lowest Points in a Decade", *The Express Tribune*, March 18, 2017, <https://tribune.com.pk/story/1358512/lowest-decade-water-levels-mangla-terbela-lowest-points/> . Accessed on September 27, 2017.

- **Water Utilisation:** It is not that Pakistan does not have enough water but its water utilisation is among the worst in the world. For example, (a) its water intensity rate—the amount of water, in cubic metres, used per unit of GDP – is the world’s highest, which means that Pakistan’s economy is more water intensive and water dependent than any other country in the world. Against the world average of \$8.6, Pakistan’s one cubic metre of water contributes only 34 cents to its GDP.<sup>15</sup> (b) It is also indicative of the inefficiency of water usage because only 36 percent of the water reaches the fields, with 64 percent being lost in transmission.<sup>16</sup> (c) As noted by the Economic Survey, Pakistan’s crop productivity per unit of water is very low at 0.13 kg per cubic metre. What this means is that “Pakistan is using 97 percent of its allocated water resources to support one of the lowest productivities in the world per unit of water.”<sup>17</sup>
- **Ground Water Depletion:** Ground water, akin to the family gold, to be used as a last resort when surface supplies are disrupted, is also depleting very fast. Satellite data shows that the Indus basin aquifer is now among the most stressed in the world. This means that Pakistan does not have much ground water in reserve that can be used as the river system becomes more stressed.<sup>18</sup> Of the 55 MAF of ground water, about 45 MAF is being exploited to supplement the surface water through public sector and private tubewells that numbered about 1.1 million by 2014. This is unsustainable because the gap between withdrawal and recharge is growing. Ground water supplies are depleting at 16–55 centimetres a year, according to a study carried out by the International Waterlogging and Salinity Research Institute (IWASRI), part of the Water and Power Development Authority (WAPDA).

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15. n. 13.

16. Kamal, n. 12.

17. Ibid.

18. Syed Mohammad Ali, “IMF’s Advice for our Water Woes”, *Express Tribune*, July 10, 2015, <https://tribune.com.pk/story/917872/imfs-advice-for-our-water-woes/>. Accessed on September 26, 2017.

and Salinity Research Institute (IWASRI), part of the Water and Power Development Authority (WAPDA).<sup>19</sup> The irrigation department of Punjab has stated that while in the 1990s, water could be extracted in the province at a depth of 20–40 ft below the ground, in the 2010s, drilling now has to take place at close to 800 ft below the ground. Additionally, this indiscriminate pumping and heavy use of pesticides are contaminating the aquifer, with tubewell salinity increasing. It is estimated that 14 percent of the ground water reserves are highly saline, unfit for drinking purposes as well as irrigation, and there is now saline water intrusion into mined aquifers.<sup>20</sup>

## THE SITUATION, UNFORTUNATELY, IS LIKELY TO GET WORSE.

### WHY?

**Climate Change:** Due to climate change, there have been increased glacial melts causing heavy flooding followed by periods of reduced availability. Already, a reduction in the long-term average availability of water has been noticed. A statistical comparison of surface water availability between the last 30 and 10 years points towards declining water flows. While average flows for the years 1978 to 2008 equal 140-145 MAF, the same for 1998–2008 is 128.52 MAF.<sup>21</sup>

Practically speaking, this has resulted in decline in water availability during the rabi season (sowing in October–December and harvesting in April–May) in 2013–14 by 10.7 percent, in 2014–15 by 9.1 percent, in 2015–16 by 20 percent and in 2016-17 by 25 percent.<sup>22</sup>

**Water Demand:** The UN estimates that water demand in Pakistan is growing at an annual rate of 10 percent.<sup>23</sup> Given the estimates of a population of 220 million in 2025, the water demand is projected to rise to 274 MAF

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19. n. 13.

20. Kamal, n. 12.

21. Kaiser Bengali, "Water Management under Constraints: The Need for a Paradigm Shift", in Kugelman and Hathaway, eds., n. 12, p. 48.

22. Khaleeq Kiani, "Water Shortage Worsens for Rabi Crops", *Dawn*, October 14, 2015, <https://www.dawn.com/news/1212909>. Accessed on September 27, 2017.

23. UNESCO, *UN World Water Development Report* (New York: United Nations, 2012), p. 823, cited in Daanish Mustafa, Majed Akhter, and Natalie Nasrallah, eds., *Understanding Pakistan's Water-Security Nexus* (Washington DC: United States Institute of Peace, 2013).

by 2025, while water availability is not likely to change from the current 200 MAF. This gap of about 74 MAF is almost two-thirds of the Indus river's current annual average flow.<sup>24</sup> And this is without India utilising fully its share of the western tributaries of the Indus (3.6 MAF) and Afghanistan not storing the waters of the Kabul river.<sup>25</sup> (4.7 MAF) The International Monetary Fund (IMF) report, "Is the Glass Half Empty or Half Full?" takes the figures of water availability at 191 MAF and so projects a water shortage at 83 MAF by 2025.<sup>26</sup>

**The Pakistan Senate passed a resolution on March 7, 2016, asking the government to 'revisit' the Indus Waters Treaty with India, something that *Dawn* called "bizzare".**

Where will Pakistan get this additional water from ? It can be only through one of two ways: the first is massive investment in the water sector— build dams, promote rain water harvesting, drip irrigation, improve water infrastructure and water efficiency. However, there are very little signs that any of this is happening at the time of writing.

The second option that Pakistan has is to blame India for its water woes, accusing it of "water terrorism". Such calls will increase as will calls to either scrap or "revisit" the Indus Waters Treaty (IWT). For example, the Pakistan Senate passed a resolution on March 7, 2016, asking the government to "revisit" the Indus Waters Treaty with India, something that *Dawn* called "bizzare".<sup>27</sup>

## EDUCATION EMERGENCY

According to a Government of Pakistan publication "Pakistan Vision 2025", Pakistan ranks 113th out of 120 countries in the United Nations Educational, Scientific and Cultural Organisation's (UNESCO's) Education

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24. Shaheen Akhtar, "Emerging Challenges to Indus Waters Treaty: Issues of Compliance and Trans-boundary Impacts of Indian Hydroprojects on the Western Rivers", *Focus*, vol. 28, no. 3, 2010, cited in Mustafa, et al., eds., n. 23.

25. "Sharing Water Resources with Afghanistan", *Dawn*, November 13, 2011, <https://www.dawn.com/news/673055>. Accessed on September 25, 2017.

26. Anwar Iqbal, "Water Scarcity May Threaten National Economy: IMF", *Dawn*, June 9, 2015, <https://www.dawn.com/news/1187036/water-scarcity>. Accessed on September 25, 2017.

27. "Indus Waters Treaty", editorial, *Dawn*, March 9, 2016, <https://www.dawn.com/news/1244492>. Accessed on September 26, 2017.

for All, Education Development Index. Pakistan's literacy rate (57 percent) lags well behind that of the country's neighbours."<sup>28</sup>

Not surprisingly, the Pakistan Education Task Force 2011 described the situation as an "Education Emergency"<sup>29</sup> primarily because the country's education system was among the least effective in the world. As a result, Pakistan ranked 113 out of 120 countries in the Education Development Index. Why?

- According to the Non-Governmental Organisation (NGO) Alif Ailaan, out of 52.91 million school-going children, only 27.89 million attend an educational institute (government or private), leaving 25.02 million children or nearly 50 percent, out of school. Of these, 5.1 million (other estimates, including of the Ministry of Education's Education for All, put it at about 6.7 million,) are at the primary level. Furthermore, even those admitted to schools suffer from massive drop-out rates before they reach Class 5—63 percent boys, 77 percent girls in 2011.<sup>30</sup>

The proportion of out-of-school children increases with the rise in the level of education. Thus, the corresponding figures for middle school (age group of 10–12 years) is 6.6 million or 52.1 percent; high school (age group of 13–14 years) 5.6 million or 66.7 percent; and higher secondary (age group 15–16 years) 7.5 million or 84.8 percent.<sup>31</sup> What is unfortunate is that according to official records, this figure has remained mostly unchanged since 2005.<sup>32</sup>

- While the country needs to spend 4 percent of its GDP on education, just to be on track for the Millennium Development Goals (MDGs),

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28. Pakistan Vision 2025, Ministry of Planning, Government of Pakistan. <http://www.pakbj.org/statics/css/pakbj/pdf/Pakistan-Vision-2025.pdf> Accessed on September 27, 2017.

29. "Education Emergency" is assessed to be equivalent to an estimated lost-yield to the economy on the scale of a flood every year; "Education Emergency in Pakistan", *Dawn*, March 9, 2011, <https://www.dawn.com/news/611831> Accessed on September 25, 2017.

30. Alif Ailaan, "25 Million Broken Promises: The Crisis of Pakistan's out of School Children", 2014. [https://d3n8a8pro7vhnmx.cloudfront.net/alifailaan/pages/540/attachments/original/1434016427/Alif\\_Ailaan\\_report\\_25\\_million\\_broken\\_promises\\_English.pdf?1434016427](https://d3n8a8pro7vhnmx.cloudfront.net/alifailaan/pages/540/attachments/original/1434016427/Alif_Ailaan_report_25_million_broken_promises_English.pdf?1434016427). Accessed on September 25, 2017.

31. *Ibid.*

32. Azam Khan, "Why 25 Million Children are out of School", *The Express Tribune*, August 31, 2015, <https://tribune.com.pk/story/946594/why-25-million-children-are-out-of-school-in-pakistan/>. Accessed on September 25, 2017.

its budgetary allocations have been abysmally low, hovering between 1.5 percent and 2.1 percent during the last 15 years<sup>33</sup>; 89 percent of such expenditure is administrative<sup>34</sup> and 25 percent of the rest remains unutilised.<sup>35</sup>

- The literacy rate in Pakistan is 58 percent – 74 percent in urban areas (81 percent male and 66 percent female) and 49 percent in rural areas. According to the Economic Survey 2015-16, the national literacy rate was 58 percent – 74 percent in urban areas (81 percent male and 66 percent female)

and 49 percent in rural areas. However, there was significant disparity between the provinces. While the literacy rate for Punjab was 61 percent, it was 56 percent for Sindh, 53 percent for Khyber Pakhtunkhwa (KPK) and 43 percent for Balochistan. The overall literacy rate in Pakistan has actually declined from 60 percent in 2012–13 to 58 percent in 2013–14.<sup>36</sup>

**While the country needs to spend 4 percent of its GDP on education just to be on track for the Millennium Development Goals (MDGs), its budgetary allocations have been abysmally low, hovering between at 1.5 percent and 2.1 percent during the last 15 years.**

Table 1 below illustrates the outcome of such an education or the lack of it by showing the educational levels of the labour force:

**Table 1: Labour Force and Education<sup>37</sup>**

Year	Illiterate	Primary	Middle	Matric	Inter	BA
1990–91	53.0	22.7	10.9	9.6	3.0	1.7
2001–02	36.7	25.7	15.9	14.6	4.7	2.3
2010–11	35.3	26.0	16.4	13.8	5.3	3.3

33. "Pakistan: Education for All, Review Report 2015", Pakistan Ministry of Education June 2014, In Collaboration With UNESCO.

34. Ibid.

35. "Financing Education in Pakistan, Opportunities for Action", Country Case Study for the Oslo Summit on Education for Development, July 6–7, 2015, p. 12.

36. Economic Survey of Pakistan 2015–16, p. 174.

37. Rashid Amjad, "Why Has Pakistan Not Reaped Its Demographic Dividend?", in Zeba A. Sathar, Rabbi Royan and John Bongaarts, eds., *Capturing the Demographic Dividend in Pakistan* (Islamabad: The Population Council, 2013), p. 50.



In other words, 61 percent of the labour force was either illiterate or had just primary education and only 3.3 percent of the labour force comprised graduates.

The Economic Survey of Pakistan, 2014–15, highlighted the fact that there had been a marked deterioration since the previous year in all three competencies, i.e., language—Urdu/Sindhi/Pashto; English; and arithmetic. For example, quoting the Annual Survey of Education Report (ASER), 2014, it noted that while 50 percent of Class 5 students could read a Class 2 Urdu/Sindhi/Pashto story in 2013, only 46 percent could do so in 2014. For English in 2014, 42 percent of Class 5 students could read Class 2 level English sentences as compared to 43 percent in 2013. Similarly, 40 percent of Class 5 students were able to do two-digit division sums in 2014 compared to 43 percent in 2013.<sup>38</sup>

Pakistan's noted nuclear scientist, Dr Samar Mubarakmand, while delivering the keynote address at the ninth convocation of the Government College University (GCU) in December 2010, stated that there was a need of thousands of mathematicians, chemical analysts, engineers and other experts. However, he regretted that Pakistan had a very small number of educational institutions of higher education that were producing quality manpower.<sup>39</sup>

According to the United Nations Global Education Monitoring Report, 2016, the cumulative impact of a lack of sustained focus on education had resulted in Pakistan being more than 50 years behind in its primary education targets and 60 years in its secondary education targets.<sup>40</sup>

Given the state of education in Pakistan, especially scientific education, it is hardly surprisingly that Pakistan is among the least innovative countries in the world. According to the Global Innovation Index (GII) 2016, co-published by Cornell University, INSEAD (Institut Européen d'Administration des Affaires) and the World Intellectual Property Organisation, Pakistan ranked

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38. n. 36.

39. "Another Reko Diq in North Waziristan", *The News*, December 4, 2010, <https://www.dawn.com/news/588404>. Accessed on September 25, 2017.

40. "UN Report: Pakistan's Education 50 Years Behind World", *The Express Tribune*, September 7, 2016, <https://tribune.com.pk/story/1177702/un-report-pakistans-education-50-years-behind-world/>. Accessed on September 27, 2017.

119 of 128 countries surveyed. The current allocation on research was only 0.29 percent of the GDP, far below the world average, as most developed countries spend between 2 and 4 percent of their GDP on research.<sup>41</sup>

The most controversial and crucial aspect of education is, of course, the curriculum or what is actually taught in schools since this provides the roadmap for the future generations. In Pakistan's case, this is all the more so since, from the time of Ayub Khan, only officially published textbooks are allowed to be used from Class 1 to college level in order to enable the governments to set the curriculum as per their own predilections.

Although much attention has remained focussed on the role of *madrassas*, it is the government educational institutions and academia that have become a key factor in extremism and terrorism. A report titled "The Subtle Subversion: The State of Curricula and Textbooks in Pakistan", edited by A.H. Nayyar and Ahmad Salim (2004) and published by the Sustainable Development Policy Institute (SDPI), an Islamabad-based think-tank, has identified several issues in the curricula and textbooks that included factual inaccuracies and omissions which distorted the nature and significance of actual events; incitement to militancy and violence that included encouragement of *jihād* and *shahadat*, a glorification of war and the use of force; encouragement of prejudice, bigotry and discrimination towards fellow citizens, especially women and religious minorities, and other nations.

The report revealed: "*Madrassas are not the only institutions breeding hate, intolerance, a distorted worldview, etc. The educational material in the government run schools does much more than madrassas. The textbooks tell lies, create hatred, inculcate militancy, and much more.... the curriculum encourages ideas that are*

**The Economic Survey of Pakistan, 2014–15, highlighted the fact that there had been a marked deterioration since the previous year in all three competencies, i.e., language—Urdu/Sindhi/Pashto; English; and arithmetic.**

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41. "Pakistan Among the Least Innovative Countries in the World, Report Says", *The Express Tribune*, September 8, 2016, <https://tribune.com.pk/story/1177993/pakistan-among-least-innovative-countries-world-report-says/>. Accessed on September 25, 2017.

**Madrassas are not the only institutions breeding hate, intolerance, a distorted worldview, etc. The educational material in the government run schools does much more than *madrassas*. The textbooks tell lies, create hatred, inculcate militancy, and much more....**

*incompatible with the ideals of Pakistan as a forward looking modern state committed to equal rights and equitable treatment for its citizens.”*<sup>42</sup>

The reason for such distortions is clearly the effort to Islamise education. Zia-ul-Haq laid down the objectives of education in Pakistan. He ordered: “*The highest priority would be given to the revision of the curricula with a view to reorganizing the entire content around Islamic thought and giving education an ideological orientation so that Islamic ideology permeates the thinking of the younger generation and helps them with the necessary conviction and ability to refashion society according to Islamic tenets.*” As a result, political Islam

became part and parcel of the curriculum up to university level.<sup>43</sup>

Zia’s instructions were operationalised by the University Grants Commission’s directive to textbook authors “...*To guide students towards the ultimate goal of Pakistan—the creation of a completely Islamicized State*”.<sup>44</sup> India and Hindus were converted into caricatures, with two outstanding features: cowardice and deviousness.

As a result, since Zia’s time, “Islam was used to support the state’s own militaristic policies in a way that it appeared to the readers of these textbooks that Pakistan, the Pakistan Movement, Pakistan’s wars with India and the Kashmir issue were all connected not only with Pakistani nationalism but with Islam itself.”<sup>45</sup>

42. A.H. Nayyar, “Insensitivity to the Religious Diversity of the Nation”, in A. H. Nayyar and Ahmad Salim, eds., *The Subtle Subversion: The State of Curricula and Textbooks in Pakistan* (Islamabad: Sustainable Development Policy Institute, 2004), <http://www.sdpi.org/publications/files/State%20of%20Curr&TextBooks.pdf>. Accessed on September 26, 2017.

43. Cited in United States Commission on International Religious Freedom, “Connecting the Dots: Education and Religious Discrimination in Pakistan. A Study of Public Schools and Madrassas”, November 2011, p. 13, [https://www.uscirf.gov/sites/default/files/resources/Pakistan-ConnectingTheDots-Email\(3\).pdf](https://www.uscirf.gov/sites/default/files/resources/Pakistan-ConnectingTheDots-Email(3).pdf). Accessed on September 26, 2017.

44. Cited in Stephen Cohen, *The Idea of Pakistan* (New Delhi: OUP, 2004), p.171.

45. Tariq Rahman, “Denizens of Alien Worlds”, cited in Haroon Mustafa Janjua, “Curricula of Deception”, *The Nation*, January 3, 2015, <http://nation.com.pk/columns/03-Jan-2015/curricula-of-deception>. Accessed on September 26, 2017.

While the curriculum is distorted enough, a study found that upwards of 80 percent of the public school teachers viewed non-Muslims as “enemies of Islam” in some form or other.<sup>46</sup> And such values have been transmitted repeatedly to successive generations of students over the last three decades.

## ECONOMY

Pakistan’s economic growth since the 1950s has been marked by a persistence of periodic crises and bailouts, and by high volatility in growth rates due to a ‘stop-go’ growth model.

The primary reason is poor governance that has resulted in Pakistan’s economy suffering from structural weaknesses that have not been rectified over the decades and will not be rectified by ad hoc, band-aid type of solutions. The key among these structural weaknesses are: the high dependence upon external factors like foreign assistance, exports and workers’ remittances instead of internal drivers of growth; high burden of debt repayment; inadequate measures to raise the rate of savings and investment; low investment as a percentage of GDP in the social sectors such as health and education; a very high defence burden; revenue shortages; and so on.

The results of these structural flaws have been: low rates of growth; poor infrastructure; lack of industrialisation; a widening trade gap; high incidence of poverty; low social development indicators; a low literacy rate; and an unskilled workforce.

Given this, it is not surprising that the growth of the economy from US \$50 billion to US \$275 billion in the last 15 years, and increase in the per capita income from \$490 to \$1,370, has not been translated into the well-being of the population. Instead, it has widened disparities between the rich and the poor.<sup>47</sup> The income share of the richest 20 percent of the population increased by 12 percent — from 43.5 percent in 1987-88 to 48.7 percent in 2010-11. And that of the poorest 20 percent has shrunk by 21

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46. n. 43, p. 16.

47. Asad Rizvi, “Pakistan’s Economic and Financial Problems and Global Outlook 2015”, *Business Recorder*, January 2, 2015, <https://www.linkedin.com/pulse/pakistans-economic-financial-problems-global-outlook-2015-asad-rizvi>. Accessed on September 27, 2017.

**The results of these structural flaws have been: low rates of growth; poor infrastructure; lack of industrialisation; a widening trade gap; high incidence of poverty; low social development indicators; a low literacy rate; and an unskilled workforce.**

percent from 8.8 percent to 7.0 percent over the same period.<sup>48</sup>

According to a noted Pakistani economist, “The new *jagirdars* of the economy and politics are no longer the traditional landowners and industrialists, but stock market brokers, property developers, and grain and fuel importers and traders.” He describes Pakistan as a casino economy, “where a wily few siphon off money from the pockets of the unsuspecting populace.”<sup>49</sup>

Ostensibly, the economy looks okay. The stock market is doing well, foreign reserves are healthy, the growth rate, has picked up from the under 4 percent growth of the 2000s.

However, macro-economic indicators have deteriorated. Just one example would suffice. Former Prime Minister (PM) Nawaz Sharif’s government had obtained a whopping \$35 billion in new loans during the first four years of its tenure to repay maturing debt and keep official foreign currency reserves at a level which could give a sense of economic stability to investors.<sup>50</sup> About \$17 billion or nearly half of the total loans obtained from July 2013 to June 2017 were utilised to repay the previous debt. The government added net \$18 billion to the country’s total external debt and liabilities – the highest amount added by any government during its tenure.

Since 2013, total public debt has increased from Rs 14.5 trillion to nearly Rs 22 trillion, a 50 percent increase in four years.<sup>51</sup> The trade deficit has reached an alarming \$26.9 billion and it is likely to grow to \$30 billion this year. The current

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48. Kaiser Bengali, “Pakistan’s Casino Economy: A Blueprint for Inequality”, *Dawn*, September 29, 2016, <https://www.dawn.com/news/1286841/pakistans-casino-economy-a-blueprint-for-inequality>. Accessed on September 27, 2017.

49. *Ibid.*

50. “Nawaz Added Whopping \$35b to Pakistan’s Debt; Shahbaz Rana”, *The Express Tribune*, July 30, 2017, <https://tribune.com.pk/story/1469896/nawaz-added-whopping-35b-pakistans-debt/>. Accessed on September 27, 2017.

51. Sakib Sherani, “Economic Pressure Points”, *Dawn*, September 1, 2017, <https://www.dawn.com/news/1355187/economic-pressure-points>. Accessed on September 27, 2017.

account deficit has reached \$12 billion and Pakistan is sinking fast. It will soon have to negotiate new loans with the International Monetary Fund (IMF) to pay off old loans, thereby going deeper into an abyss.<sup>52</sup>

In 2008, Pakistan went to the IMF with reserves sufficient for barely two months of imports, and in 2013, that figure was 1.7 months, according to World Bank data. In both those years, the White House perceived Pakistan as a vital ally in the war against terrorism. That perception played a critical role in ensuring that most of the truly difficult

preconditions that accompany such a bailout were not imposed.<sup>53</sup> Today, in the absence of good ties with Washington and despite the US having much lower direct bilateral leverage on Pakistan due to its dwindled economic as well as military assistance, it can nevertheless exert substantial leverage via its control of the IMF and International Financial Institutions (IFIs) such as the World Bank. The 'force multiplier' that can be used to the US' advantage is the framework of concerted lending whereby all international lending institutions, and the world's investment hubs, follow the lead of the IMF on a particular country.<sup>54</sup>

In a nutshell, the kind of borrowing that Pakistan has indulged in is unsustainable and together with declining exports and remittances from overseas workers, the Pakistani economy is headed for a severe balance of payment crisis in the very near future.

Apart from finances, energy is an area of critical shortages with swathes of the country suffering up to twelve hours of power cuts. The energy deficit

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52. Atta-ur-Rahman, "A New Governance System", *The News*, August 30, 2017, <https://www.thenews.com.pk/print/226994-A-new-governance-system>. Accessed on September 27, 2017.

53. Editorial, *Dawn*, September 6, 2017, <https://www.dawn.com/news/1355908/depleting-reserves>. Accessed on September 27, 2017.

54. Sherani, n. 51.

has reduced production – including in the vital textile sector – curtailed economic growth and discouraged foreign investment.

Three parameters can be used to judge the economy:

- **Growth:** Average annual GDP growth rates have been as follows<sup>55</sup>-
  - 1960s: 6.8 percent,
  - 1970s: 4.8 percent
  - 1980s: 6.5 percent,
  - 1990s: 4.6 percent
  - 2000s: 4.9 percent
  - 2010s: 3.2 percent.
  - 2014–15: 4.2 percent
  - 2015–16: 4.7 percent
  - 2016-17: 5.28 percent<sup>56</sup>

The government's figure of 4.7 percent was contested by noted economist Dr Hafiz Pasha who held that the real GDP growth was nearer to 3.1 percent.<sup>57</sup>

- **Employment:** With the present rate of growth of around 5 percent, Pakistan's economy generates employment for less than a million persons per year. The challenge is to accelerate growth to 7–8 percent if it is to generate employment for the more than 3 million people who are entering the labour market annually. This does not seem to be happening in the near to medium term. To do so on a sustained basis, the country would have to raise the level of investment from the current rate of 15.21 percent of GDP to about 25 percent of the GDP, with special attention on human and social development.<sup>58</sup> This level of investment is impossible to achieve without a simultaneous increase in the rate of national savings. The domestic rate of saving would have to be increased from the current

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55. n. 28.

56. Relevant Economic Surveys of Pakistan.

57. "Number Fudging Allegations", editorial, *Pakistan Today*, June 9, 2016, <https://www.pakistantoday.com.pk/2016/06/09/number-fudging-allegations/>. Accessed on September 27, 2017.

58. Private sector investments declined from 10.2 percent of the GDP in 2014–15 to 9.8 percent of the GDP in 2015–16, signalling that the private sector was unwilling to make fresh investments and modernise existing plants. The public sector investment went up marginally from 3.7 percent of the GDP in 2014–15 to 3.8 percent of the GDP in 2015–16.

8.3 percent to about 20 percent of the GDP on a sustained basis. This will be possible only with policies that encourage savings and discourage consumption.

- **Poverty:** The net impact of Pakistan's economic development over the decades has been the rise in the incidence of poverty from 18 percent in 1988-89 to 33 percent currently. Applying a multi-dimensional poverty index (a combination of the levels of education, health and standard of living), the Oxford Department of International Development showed that in 2012-13, 44.2 percent of Pakistanis were poor, 23.7 percent were in severe poverty, and 15.1 percent were vulnerable to poverty.

**In a nutshell, the kind of borrowing that Pakistan has indulged in is unsustainable and together with declining exports and remittances from overseas workers, the Pakistani economy is headed for a severe balance of payment crisis in the very near future.**

High poverty levels are reflected in food insecurity. According to the World Food Programme (WFP) (September 2016):

- 43 percent of the population was food insecure, with 18 percent facing a severe shortage;
- about 15 percent of the population under the age of five was acutely malnourished;
- close to 43 percent children face stunted (low height for age) growth and were chronically malnourished. The World Health Organisation (WHO) puts the number of stunted children at 50 percent.<sup>59</sup> As things stand, Pakistan will have a generation of stunted children in the next 15 years, only adding to the cycle of poverty. Stunting and wasting have actually increased: among children under the age of five years, stunting has increased from 41.6 percent in 2001 to 43.7 percent in 2011, and wasting has increased from 14.3 percent in 2001 to 15.1 percent in 2011. There has

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59. "Food Basics", editorial, *The News*, June 19, 2017, <https://www.thenews.com.pk/print/211337-Food-basics> . Accessed on September 27, 2017.



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been no change in the percentage of underweight children since 2001, which is 31.5 percent.<sup>60</sup>

#### POPULATION

Thomas Robert Malthus, in his 1798 masterpiece "An Essay on the Principle of Population", put forward the argument that population growth was potentially exponential while the growth of the food supply was arithmetical at best. Malthus believed there were two types of "checks" that kept population growth in line with the growth of the food supply: "preventive checks", such as moral restraints and "positive checks", which led to premature death: disease, starvation, war, resulting in what is called a Malthusian catastrophe. The catastrophe would return the population to a lower, more "sustainable", level.

Modern day demographers, however, give far more importance to age structures rather than the total population. This is based on the reality that while the young and the old tend to consume more than they produce, the working age population tends to produce more than it consumes. Thus, countries that have a larger proportion of working age population relative to the young and elderly dependents is said to be undergoing a demographic transition that creates the conditions for a demographic dividend.

However, a demographic dividend is a time-specific window of opportunity, and does not last indefinitely. Over time, the age structure changes again, as the large adult population starts ageing and becomes less productive.<sup>61</sup> Thus, the demographic dividend only creates the conditions for an economic spurt that has to be harnessed. If harnessed, it could lead to potentially greater economic activity. If it is not capitalised upon, it could lead to massive unemployment and its attendant consequences.

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60. Hilda Saeed, Moniza Inam, Zofeen T. Ebrahim, Madiha Latif, "Malnutrition: A Layered Problem", *Dawn*, January 17, 2015, <http://www.dawn.com/news/1232897>. Accessed on September 27, 2017.

61. Durr-e-Nayab, "Demographic Dividend or Demographic Threat in Pakistan", Islamabad: Pakistan Institute of Development Economics, Working Papers, 2006, <http://pide.org.pk/pdf/Working%20Paper/Demographic%20Dividend%20Final.pdf>. Accessed on September 28, 2017.

Pakistan's working age population of 15–64 years reached 52 percent in the early 1990s, 59 percent in 2006, and is currently estimated to be 60.4 percent, creating the possibility of a demographic dividend. The current share of 60 percent of the working age population would peak at 68 percent around 2045 by when it will start declining again as the population begins to age and moves out of the working age group.<sup>62</sup>

Thus, the once in a lifetime window for Pakistan for a 'demographic dividend' is roughly between 1990 and 2045. Of these 55 years, 25 have already passed without any visible pick-up in economic activity.

To actualise the demographic dividend, the basic question is whether those entering the labour market can be absorbed productively against the backdrop of an increasingly globalised and technologically advanced world.

Based on Pakistan's population projections, 3.1 million persons are expected to enter the labour force every year over the next four decades. However, at current growth rates, the economy can absorb only around one million people.

So what happens to the 2.1 million year on year for the next four decades and beyond? In other words, what happens if the demographic dividend is not realised ?

The flip side of an unrealised demographic dividend is that the massive 'youth bulge' could pose a serious threat to law and order, including, in Pakistan's case, of terrorism. The danger for Pakistan is that without sustained economic growth and without investment in education, the demographic dividend would degenerate into a 'demographic horde' with all its attendant consequences of frustration, alienation and violence. A more widespread risk is of youth radicalisation – the threat of millions of young, impoverished and unemployed Pakistanis succumbing to extremism. As the government's own

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62. Ibid.

**A large set of Pakistani youth is dissatisfied, frustrated and in a state of disarray due to low education levels and large-scale unemployment. This has led to serious social problems, including drug abuse, crime, mental disorder, terrorism and religious fanaticism.**

Pakistan Vision 2025 puts it, "A large set of Pakistani youth is dissatisfied, frustrated and in a state of disarray due to low education levels and large-scale unemployment. This has led to serious social problems, including drug abuse, crime, mental disorder, terrorism and religious fanaticism."<sup>63</sup>

A crucial question is whether Pakistan is taking sufficient measures to deal with the non-traditional security threats. The short answer has to be no.

Just two examples will clarify this.

Even though the looming water crisis is such a critical issue, the government has stopped research funding of the Pakistan Council for Research in Water Resources (PCRWR) for water development projects, for 2015–16, which could find some solutions to this problem. Second, the federal government, instead of increasing the allocation for water projects, has actually reduced it by a whopping 27 percent in the Public Sector Development Plan 2015–16. Pakistan spends 0.25 percent of its GDP on water development. In comparison, it spends 47 times more on defence.<sup>64</sup>

In Punjab, the breadbasket of Pakistan, the financial allocation for the water sector in 2014–15 was around 5 percent of the total annual development plan of the provincial government. Of the Rs 250 million so allocated, only Rs 61 million was actually released, with the rest of the funds lapsing/ being diverted to other areas. Worse, 33 percent of the total number of water-related schemes were dysfunctional in the province.<sup>65</sup>

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63. n. 28.

64. Jamal Shahid, "Despite Dire Need, Government Unwilling to Fund Research", *Dawn*, May 4, 2015, <https://www.dawn.com/news/1179878>. Accessed on September 28, 2017. See also Fawad Yousafzai, "Munda Dam Falling Prey to Red Tape", *The Nation*, June 20, 2015, <http://nation.com.pk/national/20-Jun-2015/munda-dam-falling-prey-to-red-tape>. Accessed on September 28, 2017.

65. "The Indus Equation", Strategic Foresight Group, Mumbai, 2011.

## ENVIRONMENTAL ISSUES

There is a lot of scientific uncertainty about the nature and effect of climate change, especially on issues like glacial melt, rainfall and resultant water availability in Pakistan. And there is a raging debate on how fast the Himalayan glaciers are retreating and to what extent this will affect Pakistan. According to a 2010 Dutch study, 60 percent of the Indus waters are made up of Himalayan melts (glacial and snow) and there is likely to be an 8.4 percent decrease in upstream water flows in the Indus due to climate change by 2050.<sup>66</sup> The impact, however, is already visible in terms of frequent flooding and spells of very high temperature. Since the river flows are heavily dependent on the Himalayan glacial melt, any impact of global warming on these mountains will have a double whammy impact – first, flooding due to the accelerated melting, and thereafter, decrease in river flows. According to the World Bank, it could aggravate the “already serious problems” of flooding and poor drainage in the Indus basin over the next 50 years, followed by up to a “terrifying” 30–40 percent drop in river flows in 100 years’ time.<sup>67</sup>

The Global Climate Risk Index (CRI) 2016 released by the German think-tank German Watch ranked Pakistan eighth on its list of most affected countries during 1995–2014. It also listed Pakistan fifth among the countries most affected by climate change in 2014.<sup>68</sup>

One of the most devastating consequences of the inefficiency of water usage has been the destruction of the Indus delta. “With the reduction of the historical flow of water into the delta region to barely 0.50–0.70 MAF per year, the sixth biggest mangrove forest in the world has been reduced from 0.6 million to 0.25 million acres.”<sup>69</sup> In addition, the drying up of the Indus delta has led to sea intrusion up to 225 km. The two *tehsils* of district Thatta, i.e., Kharo Chan and Keti Bander, have almost been eliminated from

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66. Ibid

67. World Bank, “Pakistan Country Water Resources Assistance Strategy—Water Economy: Running Dry,” Report No. 34081-PK, November 22, 2005, Agriculture and Rural Development Sector, South Asia Region, World Bank, p. xi.

68. German Watch, Global Climate Risk Index 2016, November 2015. <https://germanwatch.org/fr/download/13503.pdf>. Accessed on September 28, 2017.

69. Kamal, n. 12, p. 35.

**The Global Climate Risk Index (CRI) 2016 released by the German think-tank German Watch ranked Pakistan eighth on its list of most affected countries during 1995–2014. It also listed Pakistan fifth among the countries most affected by climate change in 2014.**

Pakistan in the past three decades and now only a few thousand fishermen reside along the coastal belt of Keti Bander and Kharo Chan.<sup>70</sup> Likewise, hundreds of villages in Badin district have been deserted and around 3.5 lakh people have been forced to migrate to other areas in search of livelihoods. As of 2012, apart from the traditionally at-risk districts of Thatta and Badin, even districts like Sanghar, Umerkot, Mirpurkhas, Nawabshah and Naushehro Feroz, parts of Hyderabad in Sindh, have also been classified as being at risk of increasing soil infertility as a result of salinity due to sea water intrusion. This is the accumulated 'environmental debt' (a term used by the World Bank) that Pakistan's future generations will have to pay.

Rapid urbanisation in Pakistan is likely to create additional problems when it comes to the availability of water, as the example of Karachi shows. The present supply of water to Karachi from Indus and Hub sources is approximately 650 Million Gallons per Day (MGD) while the demand for the 20 million population is estimated to be 1,080 MGD (54 gallons per capita per day) making a shortfall of 430 MGD. By 2020, the population of Karachi is expected to be around 23 million and the demand of water would be 1,242 MGD, taking the shortfall to 600 MGD.<sup>71</sup> With about 40 percent of water being lost through leakages and theft, and at current population growth rates, Karachi will need massive schemes every year but there are no additional sources of water available.

While massive shortages are one issue, the other is that of contamination. A study by the Institute of Environmental Studies of Karachi University showed high levels of faecal contamination and rare presence of chlorine

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70. "Arabian Sea Eating up 100 Acres of Sindh Land Daily", *The News*, September 28, 2015, <https://www.thenews.com.pk/print/14892-arabian-sea-eating-up-100-acres-of-sindh-land-daily>. Accessed on September 28, 2017.

71. Shaikh Abdul Rasheed, "Provision of Safe Drinking Water: A New Challenge for Pakistan", *The Nation*, June 13, 2015, <http://nation.com.pk/blogs/13-Jun-2015/provision-of-safe-drinking-water-a-new-challenge-for-pakistan>. Accessed on September 28, 2017.

in the piped water being supplied to Orangi town, in Karachi. Only nine samples out of 46 were found fit for human consumption.<sup>72</sup> The other issue is of untreated water being released into the sea. "Rivers flowing through the city contain lead, chromium and cyanide, and more metals have been found in Karachi's harbour than in any other major world harbour. Karachi's own mayor has judged that 400 million gallons of sewage pour into the sea, untreated, every day."<sup>73</sup> The impact of this manifests in statistics like at least 30,000 Karachiites (of whom 20,000 are children) perishing each year from drinking unsafe water. In fact, it has been estimated that more people in Karachi die each month from contaminated water than have been killed by India's army since 1947. According to a report of the Pakistan Council of Research in Water Resources (PCRWR), the mortality rate of children under five due to contaminated water is 101 per 1,000 children.<sup>74</sup>

Surveys conducted by the Pakistan Council of Research in Water Resources (PCRWR) of water sources in 25 cities across the country show that almost 90 percent of the water supplied to homes in Pakistan is contaminated, and at least 69 percent of water sources are contaminated as well. Almost 57 percent of the samples contain bacterial contamination, and almost 6 percent of the water sources are contaminated with arsenic while 15 percent are contaminated with chlorine. This is a serious challenge for the public health authorities and one that has not been tackled.<sup>75</sup>

Just one example would illustrate the scale of the problem. According to the UN Commission on Sustainable Development, 200,000 children die annually from diarrhoeal diseases alone in Pakistan. The total number of civilians, security force personnel, and terrorists who died between 2003 and September 22, 2017 was 62,483.<sup>76</sup> These figures alone should give any government in Pakistan nightmares about the NTST that it faces.

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72. "Water in Karachi's Orangi Town Contaminated with Faecal Waste: Study", *Dawn*, January 15, 2016, <https://www.dawn.com/news/1233002>. Accessed on September 28, 2017.

73. Michael Kugelman, "Introduction" in Kugelman and Hathaway, eds., n. 12.

74. Rasheed, n. 71.

75. "Quest for Clean Water", Editorial in *The News*, September 15, 2017, <https://www.thenews.com.pk/print/230058-Quest-for-clean-water>. Accessed on September 28, 2017.

76. "The Big Problem with Water", Editorial in *The Express Tribune*, September 27, 2017, <https://tribune.com.pk/story/1517024/big-problem-water/>. Accessed on September 28, 2017.

## CONCLUSION

It is obvious that Pakistan is faced with hydra-headed problems: increasingly diminishing water supplies, an uneducated horde of young people, an economy on the drip, demographic pressures, lack of jobs, and a growing radicalised population. A massive youth bulge that is uneducated or poorly educated and does not have jobs will become cannon fodder for the various *jihadi* organisations. Agriculture that could have absorbed some of the youth is itself in crisis due to the diminishing water supplies. Such a combination will lead to unacceptable social chaos and anarchy that the army too will not be able to control or be immune from. No amount of nuclear weapons, non-state actors or Chinese assistance will help Pakistan in tackling these non-traditional security threats.

Deteriorating water security would be catastrophic for Pakistan where irrigated agriculture plays such a dominant part in the economy and on which 60 percent of the population is dependent. Any decrease in crop yields will affect both livelihoods and food security. There are no short-cuts here. Pakistan will have to make massive investments in its water infrastructure to stay afloat. At the same time, water scarcity in Pakistan will increasingly have serious implications for Indo-Pak relations and cries of India's alleged 'water terrorism' will increase.

As an editorial in the *Express Tribune* puts it: "In reality, terrorism and extremism... have never presented a truly existential threat to Pakistan. Neither has come close to bringing down the edifices of state and neither shows that capacity on current form nor is likely to in the foreseeable future. But the water problem just might do what all the forces of darkness have as yet failed to do."<sup>77</sup>

The current 'educational emergency' in Pakistan is a serious security threat because an uneducated or poorly educated population is a recipe for disaster in an increasingly technological and globalised world. It is the result of decades of neglect of the education sector and it will take decades to be overcome, provided a determined start is made immediately. For Pakistan's

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77. Ibid.

leaders to continue to ignore the challenges is suicidal since more than half the population is below nineteen years of age.

Without basic change in curricula and textbooks, bigotry, violence and hatred will continue. The real fight against terrorism and to reclaim the moderate space has to begin here.

The education crisis, like the water crisis, has taken on proportions that would progressively make it extremely difficult for any government to tackle. With the population continuing to grow at an alarming 2.4 percent and a huge youth bulge, millions of children are entering the education market year after year. The colossal challenge for Pakistan is clearly educating all these millions to reap the 'demographic dividend' before the window of opportunity closes.

Pakistan has been avoiding economic collapse narrowly not because of structural changes or policy initiatives but by monetising its geographical position due to the international situation. Thrice in the last 70 years, Pakistan has been bailed out by the US just as it was going over the brink, all three times when the army was ruling. And all three times, the rulers did not use the opportunity provided by foreign bailouts to make the necessary structural changes to put Pakistan on the path of sustainable growth.

There may or may not be a fourth bailout but the crucial question is whether the leaders, civilian and military, have begun to recognise how deep-rooted the problem is and how the already yawning gap between Pakistan and the rest of the world, including its neighbours, is widening?

Twenty-five years of the once-in-a-lifetime demographic dividend window of opportunity have already passed Pakistan by without any visible signs of an economic upsurge. No thinking seems to have gone into understanding the needs of a changing age structure. The lack of investment in the education sector for decades is showing results today in terms of the quantity and quality of education and literacy rates, and especially, the poor statistics for female education.

Pakistan, thus, stands at a pivotal moment in its history. Ultimately, the question boils down to whether or not the Pakistani leadership, especially the



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military, continues to see Pakistan's security purely in military terms. If it does, Pakistan will sink deeper into the quagmire. Even if it changes its mindset and sees security in broader terms to encompass the NTSTs, it will take a Herculean effort to pull Pakistan back from the brink of the abyss, but at least it will have a chance.

Pakistan has made itself extremely vulnerable over the decades. None of the non-traditional threats is a product of a few years but due to lack of investment and governance over decades. In fact, never before in its existence of seven decades has such a combination of threats come together simultaneously. Pakistan faced an emergency situation in all these four areas about a decade ago. Today, it should be in the disaster management mode, but there are no signs that it is.

Only a leadership that has vision and comprehension of the multiple crises facing the country can deal with these NTSTs. Such a leadership will also have to have the courage and willingness to take resolute action to tackle each of the problems. Unfortunately, in the short or medium terms, such a leadership does not seem to be on the horizon.

# INTEGRATED THEATRE COMMANDS: DOES THE IDEA SUIT INDIA?

**RAMESH RAI**

## INTRODUCTION

There is talk about the division of the Indian subcontinent into theatres of war and the formation of Integrated Theatre Commands for war-fighting. This probably stems from a belief that such a division and reorganisation would promote jointness, integration and accrue operational benefits. A conflict theatre is the geographic space where military events occur. World War I had seven theatres, each the size of a continent i.e. Western Theatre, Balkans, Russia, Egypt, Africa, Asia and Australasia. During World War II, the entire geographical space of war, that engulfed almost half the planet, approximately 98 million sq km, had two theatres i.e. the European and Pacific Theatres. It seems rather unusual that India, which measures only 3.3 million sq km should divide itself into three theatres of war as per the recommendation of a committee appointed by the Ministry of Defence (MoD). Apparently, there is a difference in the perception of the term theatre between then and now, and a revisit is necessitated to understand its basic characteristics i.e. the distances involved, the influence of one on the other, the lines of communication between theatres, the location of belligerents and the strategic objectives, etc. Unless the committee's recommendation is an attempt to perpetuate the army's centrism and give it more control,

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Air Marshal **Ramesh Rai** VM (Retd) was AOC-in-C Training Command when he retired in July 2015, after serving in the Indian Air Force (IAF) for 39 years.

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considering that most strategists are still landlocked in their outlook to war-fighting. Be that as it may, let us first, understand the fundamental elements of the term 'theatre'.

#### DEFINITION

There are many definitions of the term 'theatre' as given in many sources, including dictionaries and websites. A few are given below for the reader to get an idea of its fundamental elements. The definition by Carl Von Clausewitz in his book

*On War*, however, is the most elaborate, definitive, relevant and desirable :

- The Merriam Webster Dictionary definition: The entire land, sea and air area that is, or may become, involved directly in war operations.<sup>1</sup>
- Dictionary.com definition: The entire area in which ground, sea and air forces may become directly employed in war operations, including the theatre of operations and zone of interior.<sup>2</sup>
- Militaryfactory.com definition: The area of air, land and water that is, or may become, directly involved in the conduct of war. A theatre of war does not normally encompass the geographic component commander's area of responsibility and may contain more than one theatre of operations.<sup>3</sup>
- Carl Von Clausewitz has defined the term as one that: Denotes such a portion of space over which war prevails and it has its boundaries protected and possesses a kind of independence. The protection may consist of fortresses or important natural obstacle, presented by the country or even it being separated by a considerable distance from the rest of the space embraced in war.

Such a portion is not a piece of the whole, but a small whole complete in itself and, consequently, it is more or less in such a condition that changes which take place to other points in the seat of war have only an indirect or

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1. <https://www.merriam-webster.com/dictionary/theater%20of%20war>

2. <http://www.dictionary.com/browse/theater-of-war>

3. [https://www.militaryfactory.com/dictionary/military-terms-defined.asp?term\\_id=5421](https://www.militaryfactory.com/dictionary/military-terms-defined.asp?term_id=5421)

no direct influence at all.<sup>4</sup>

### KEY CHARACTERISTICS

The key characteristics that emerge from the definition are : independence of a theatre, its demarcation through natural boundaries, large distance from the rest of the space embraced in war, so as not to bear direct influence on the other and to serve as a complete whole. The theatres of the two World Wars conformed to this definition. In World War II, the European and Pacific Theatres were over 1,000 miles removed, their operations independent, and the coastlines of various continents served as natural boundaries. Theatre Commands came into being since resources could not be quickly relocated for sustained operations and deep offensives across the Europe and Pacific arenas, owing to the vast distances, and wars being fought away from homelands. In the Indian context, carving out theatres would tantamount to making pieces of our composite whole, in total contradiction with the very basic element of the definition. Theatres would be within our homeland and adjoining. Implicit in such an arrangement would be the aspect of operational influence on each other, thereby defeating the fundamental purpose of their creation. Let us further examine the implications of these characteristics.

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### SIZE AND DISTANCE BETWEEN THEATRES

The inherent idea of a theatre relates to vast contiguous land or sea areas that translate into the size of continents, with large distances separating them. Such is the case with the US Theatre Commands (quite often referred

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4. <http://www.clausewitz.com/readings/OnWar1873/BK5ch02.html#ahttp://www.clausewitz.com/readings/OnWar1873/BK5ch02.html#a>

to, to justify our case) which divide the entire globe into six geographical theatres, each measuring approximately 40 to 50 million sq km, almost the size of continents. The separations are of over a 1,000 miles. Each serves as a composite whole, with integral forces, independence of initiation and sequencing of manoeuvres, and no influence from another theatre. But in the Indian context, theatres would measure a mere one million sq km i.e, 1/40th the size of US theatres. These theatres would be adjacent, thereby influencing one another and depriving each of their independence over initiation and sequencing of operational manoeuvres. These must logically, then be under the same commander, to weigh the implications and accord priority. What is the compelling need for theatres when operational independence is not implicit in their creation? Ours is a smaller sized country that at best needs to be seen as one theatre. The size does not warrant that we divide ourselves and our forces into pockets, merely on the belief that it would be operationally more viable. It needs to be put to simulations / tests and war-gamed for further examination. Moreover, there is no example of any country of the size of India that has divided itself into theatres for homeland defence. Interestingly, the entire US landmass, which is three times larger than India, is organised under one single theatre called USNORTHCOM. For Russia and China, which are six and three times our size, the key enablers are their size and need for out of area contingencies. Russia has reorganised into four Regional Commands but with an Independent Air and Space Command, Strategic Nuclear Forces Command and Transport Command. Clearly, the air defence of the country wasn't divided. In China's case, the Theatre Commands were established very specifically to bypass the military bureaucracy and establish direct political control over the military. Reports claim that the Theatre Commands would not directly command troops, which will be under the individual People's Liberation Army-Army, People's Liberation Army-Navy, People's Liberation Army-Air Force (PLAA, PLAN, PLAAF) Commands in each theatre except in times of war.<sup>5</sup> The Chinese Theatre Commands are still evolving and while

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5. <http://www.vifindia.org/article/2015/december/07/military-modernisation-in-china-its-implications>

some benefits may accrue, so would new vulnerabilities. But in our case, neither is the size compelling nor is the need for out of area contingencies or the stretch of our regional or global interests and, above all, we cannot afford to divide our air and space forces for there just aren't enough numbers.

### DIVISION OF FORCES

Each theatre that we form, would need to have its own army, air force and naval component integral to its structure so as to retain independence of command and manoeuvre.

While the army and navy may have sufficient

forces to be divided into three parts and still remain effective and viable war-fighting entities, such is not the case with the air force. If the Indian Air Force (IAF) were to distribute its assets to the three Theatre Commands on a permanent basis, each theatre would end up with totally untenable numbers and by design would have created an asymmetry in favour of the enemy, much to our peril. Given the lesser numbers, the country can ill afford to tie down the assets to a single theatre's operational plan when they can be available for employment in other theatres and utilised in their full capacity and capability. It is this concept of use of air power that needs to be understood by those propagating the idea of integrated Theatre Commands.

IAF aircraft have a large Radius of Action (ROA) of about 1,500+ km, with a wide mix of weapons. Thus, even when based at one geographic location, these aircraft have the ability to carry out operations anywhere in India's geographical war space. In one mission, an aircraft could cut across for a strike on the western border and then be engaged in an air interdiction on the eastern border. Such usage would not only be necessary but essential to make up for the inadequacy of numbers. More so, our aircraft have the capability to execute multiple missions such as battlefield interdiction, offensive counter-air, air interdiction, defensive counter-air, in the same mission and across

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theatres. This omni-role capability which needs to be multiplexed between theatres would fall prey to the Integrated Command Structure if forces are divided and retained for employment in one theatre alone. Thus, dividing the versatile assets of this force would be at the cost of victory.

The IAF's current force levels are at 32 fighter squadrons, 3 Airborne Warning and Control Systems (AWACS), 6 Flight Refuelling Aircraft (FRA), 10 C-17s, radars and Surface-to-Surface Air Missiles (SAMs). The strength of fighter squadrons is well below the authorised figure of 39.5 and the approved 42. On forming three theatres i.e. Northern, Western and Southern, as recommended by the committee, each theatre would have 10 / 11 fighter squadrons, 2 FRA and 1 AWACS integral to its structure. Dividing the air force into various theatres would render it weaker than the enemy in each theatre. In the Northern Theatre, our enemy is likely to field 20 to 25 fighter squadrons and likewise our western adversary has 20 squadrons to employ against our 10 integral to the Western Theatre. Rendered weak in every theatre, and in the face of such asymmetry in numbers, the air force will not be able to provide the requisite air defence and support to the ground forces. During war, a stronger side looks for the enemy and defeats him wherever he is found. A weaker side avoids being found, and hides. Thus, a weaker force would have to avoid war which would render the air force's offensive capability and capacity unusable and make our land forces vulnerable. Dividing the air force, thus, dilutes its combat potential, which can be retained only by holding it together and centrally orchestrating the air campaign and multiplexing the use of aerial assets across the entire battle space / across theatres, irrespective of how many fronts we may be fighting on. Israel demonstrated such a doctrine during the Six-Day War in 1967 and Yom Kippur War in 1973, when it faced Egypt in the south, Syria in the north and Jordan in the east concurrently. Centrally orchestrated air operations were critical to winning these wars. We need to adopt a similar approach.

### **EMPLOYMENT OF AIR FORCES**

Air forces fight in the medium of air. Though a new battle ground during the two World Wars, it is now a powerful medium, much like the army

and navy, and must be viewed that way and accorded equal status. Today, the sky is of much more interest even to the land and sea forces as it constitutes a battle ground just above their heads and which profoundly affects them. Therefore, much like equal partners, air forces must be seen as fighting for the same objective i.e. to win the war. Their sole purpose being to provide the requisite air defence and keeping the enemy air off the backs of the surface forces. Our air force has lesser numbers since larger numbers are not easily affordable. The less a nation can afford, the more carefully it must utilise what it has. This statement is what sets the tone in our unique case. The inherent flexibility, reach, concentration of mass, ability to wage war at all levels, multiplexed employment, ability to traverse distances across theatres to engage targets within a short time span and within the same mission need to be exploited. Only such exploitation can meet the challenges and threats of a two-front war and, hence, the need for central orchestration under an air force commander, who understands how this force is to be employed is vital.

**The less a nation can afford, the more carefully it must utilise what it has. This statement is what sets the tone in our unique case.**

During Operation Desert Storm, the air force and the navy had arguments concerning centralised air control. After Desert Storm, the army corps commanders criticised the air force for targeting only 300 (15 percent) of the 2,000 army-nominated targets. An air force officer justified this situation on the basis of (1) a two- to three-day lag in army intelligence from US Central Command Air Forces (USCENTAF); and (2) a redundancy in the target lists. He also said that half of the marine corps' sorties (150 to 200 a day) were dedicated to MARCENT (Marine Corps Command Centre) and, therefore, not available to the Joint Forces Air Command Centre (JFACC), which narrowed the effectiveness of JFACC management of the air effort. Centralised air command was superior to allowing theatre commanders to operate relatively independently, he concluded.<sup>6</sup>

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6. Sterling D. Sessions and Carl R. Jones, "Interoperability: A Desert Storm Case Study", McNair Paper, July 18, 1993.



**Synergy in the application of individual capabilities of the army, navy and air force is, thus, the key issue. But does that warrant creation of new structures in the form of Integrated Theatre Commands in the hope that by compulsory merging of the armed forces, integration and jointness would accrue.**

Despite abundance of air power, the need for central orchestration of aerial forces of various arms was still felt in Operation Desert Storm. In our case, it would be a necessity. A Rand Corporation note evaluating employment of air power in the Gulf says that the role of the joint force air component commander was never put to the test as the sheer mass of air power available allowed the command to employ it inefficiently at times and to cater to the doctrinal preferences of the various Services.<sup>7</sup> Such is not the situation in India as our air power assets are woefully less. With lesser numbers, we cannot afford inefficient employment. Air support to surface forces is one of the most important tasks for any air force but not the only one. The biggest flaw and inappropriate use would be to utilise air power solely as an auxiliary to the army and navy. Its speed, reach, quick turnaround, freedom of action, deep penetration and flexibility in employment is only vaguely understood by the surface force commanders. Integrating the air force under the Army or Navy Command would render its employment primarily to assist land and sea forces, with little or no aerial force left to fight for control of the air and provide air defence. Inadequate air defence would make it easy for the enemy air force to interfere with our surface operations and that would be a sure recipe for disaster.

## **TYPES OF WARS**

India's concerns are more related to homeland defence. Building a deterrent capability, preparation for a conventional conflict and alongside dealing with low level sub-conventional operations, border skirmishes and anti-terror operations are the main demands on its armed forces. The Kargil conflict was emblematic of the kind of lower-intensity

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7. [https://www.rand.org/pubs/research\\_briefs/RB19/index1.html](https://www.rand.org/pubs/research_briefs/RB19/index1.html)

border skirmish between India and Pakistan, and perhaps also between India and China, that could recur in the next decade. Given the range and scale of such operations and the fact that conventional wars would be for border disputes, short and limited, with little territorial annexation or capture, the Theatre Command concept appears a gross overkill. Most certainly, future wars would have to be fought in an integrated manner, given the induction of new technology weapons, their destructive power and reach. Synergy in the application of the individual capabilities of the army, navy and air force is, thus, the key issue. But does that warrant creation of new structures in the form of Integrated Theatre Commands in the hope that by compulsory merging of the armed forces, integration and jointness would accrue? Problems between Commander Allied Force Gen Wesley K Clarke, and Joint Air Force Component Commander Lt. Gen Michael C Short, affected campaign planning in the Kosovo operations even while under an integrated command structure. Refusal of orders from Gen Clarke by Gen Michael Jackson, commander, Rapid Reaction Force, had to be resolved after the Kosovo conflict. In Operation Anaconda, senior army commanders were widely criticised by their naval and air counterparts for not coordinating with them effectively even while under one command. During the Indian Peace-Keeping Force (IPKF) operations in 1987, the army commander of the IPKF Unified Command elected to make a helicopter drop at Jafna University, overruling the air force element's advice of it being far too risky. Consequently, all the helicopters were damaged and a number of lives lost. These examples pointedly confirm that jointness is not implicit in an integrated command structure.

**Joint planning serves as the start point for integrated war plans and synergistic application of military power, and is necessitated irrespective of the military structure that a nation adopts.**

An excerpt from a Rand Corporation report on Operation Desert Storm highlights the same:

Operations Desert Shield/Desert Storm demonstrated the effectiveness of modern air power and joint air operations. The nature of these operations, and the extensive resources at the disposal of both US and coalition forces, however, masked the problems in command and control. Unresolved doctrinal issues and some residual controversy over roles and missions did not surface because of the abundant air assets in the theatre. Accordingly, decisions about allocating resources never became contentious. The adage that one learns more from failure than from success should be applied to the Gulf War. There is still the danger that jointness may be a façade for single-service command structures and procedures, or that its influence may stop with the CINC. Despite integrated commands, the wings of the armed forces services remained suspicious of one another and retained their individual perspectives. Jointness is, thus, not implicit in an integrated command structure but accrues by jointly planning for integrated operations with an understanding of the war-fighting tenets of the other service.<sup>8</sup>

### **JOINT PLANNING : KEY ENABLER FOR SYNERGY**

Combat performance in a future war will depend on how well the three Services are integrated. Joint planning serves as the start point for integrated war plans, and synergistic application of military power and is necessitated irrespective of the military structure that a nation adopts. Integration does not imply merging of the armed forces, but demands activities for integrated operations to be done jointly, evolved by understanding concepts of integrated war-fighting, resolving doctrinal issues, clarity on roles and missions, working closely in a cooperative mode with knowledge of the core competencies of the other Service and with an overriding perception of what is best for the nation and not necessarily for the individual Service.

It is important to recall that the correct functioning of the Higher Defence Organisation (HDO) of any nation is essential for joint planning. This organisation, in our case, the Chiefs of Staff Committee (COSC), takes directions from the government and translates them into operational

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8. James A. Winnefeld and Dana J. Johnson, *Joint Air Operations: Pursuit of Unity in Command and Control, 1942–1991* (Washington DC: RAND Corporation, 1993).

directives for commanders in the field. The Service chiefs are principal military advisers to the government and expected to meet regularly at the COSC to consider all matters of military importance and formulate defence plans jointly. Thus, integration has been fundamental to the formation and working of our higher command system and the onus is on the Service chiefs to jointly develop integrated war plans. We ignored it during the 1962 War and suffered a defeat. It became apparent after the war, that the COSC had ceased to function, as the then Defence Minister VK Krishna Menon had taken over, in all but name, command and directions of war to the army.<sup>9</sup> In the 1965 conflict, Gen JN Chaudhuri ( then Chief of the Army Staff—COAS ) bypassed the COSC and the joint intelligence and planning staff completely. The three Services were not asked to define the parts that they would have to play in the event of war. The speed of decisions taken by the prime minister, defence minister, and COAS clearly brought out that the whole business was the army's alone, with the air force as a passive spectator and the navy out of it altogether. The whole concept of the higher defence organisation was ignored.<sup>10</sup> With such attitudes, no structure, including that of the Integrated Theatre Commands would ever succeed in obtaining the desired integration.

It is strange that military personnel who share the same love for their country and are willing to sacrifice their lives for it, find it difficult to cooperate, and like the Americans, need an act of Parliament or recommendation of a committee to force down a structure that still won't ensure integration and only serve as a facade, as mentioned earlier. The US military system had completely broken down during the period 1958 to 1983, as they suffered several operational setbacks i.e. the Vietnam War, the seizure of the USS *Pueblo*, the seizure of the *Mayaguez*, the failed Iranian rescue mission, the marine barracks bombing in Beirut, and the Grenada incursion. Their failures had a number of common denominators : poor military advice to political leaders, lack of unity of command, and inability to operate jointly<sup>11</sup> and the Parliament was compelled to pass

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9. ACM P C Lal, *My Years with the IAF* (New Delhi: Lancer International), p. 158.

10. *Ibid.*, p. 162.

11. James R. Locher III, *HAS IT WORKED? The Goldwater-Nichols Reorganization Act*, p. 99.

**Jointness was amply and unarguably demonstrated during the 1971 conflict, where the three chiefs were in constant touch with the developments in the subcontinent and what the Cabinet was thinking.**

the Goldwater-Nichols Act. Such has not been our story nor have the resources had to be divided into Theatre Commands. Our system has worked in the face of the many challenges of various wars. In 1948, we blunted Pakistan's first attempt to occupy Kashmir owing to early, close and effective cooperation between our army and air force. Jointness was amply and unarguably demonstrated during the 1971 conflict, where the three chiefs were in constant touch with the developments in the subcontinent and what the Cabinet was thinking. Once the political aim was set, the three chiefs jointly arrived at mutually planned military aims, with objectives for each Service, as well as in support of the other two Services. The planning process was joint from the word go and each Service was considered an equal and important partner.<sup>12</sup> India conducted one of the most successful campaigns in history with the liberation of Bangladesh and the surrender of 86,000 Pakistan Army soldiers, a feat unprecedented after World War II. Likewise, during the Kargil conflict, (though not a full-fledged war), once the government took the bold step to employ the air force, the Indian Army and Indian Air Force (IAF) in a combined and a remarkably swift operation, threw back the intruders. There were media reports that the army demanded attack and armed helicopters without disclosing the full ground picture to the air force, and commentators criticised the IAF for the delayed start of the air action and termed it as non-cooperation, but they were not aware of the need for political clearance for the use of combat air power since it meant escalation. Without question, the effective use of the air force was pivotal in shaping the successful outcome for India of a conflict which was of Pakistan's making. While some degree of lack of transparency and coordination in the initial phase of the operation could be conceded, that would happen in the fog of war. Once resolved at the

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12. AVM AK Tiwary VM, *Indian Air Force in Wars* (New Delhi: Lancer Publishers, 2012), p. 164.

COSC, integrated combat power application was visible at the Dras, Kargil and Batalik Sectors. These examples imply that a holistic and integrated approach to war-planning is very much ingrained in, and fundamental to, the present system, provided it is made, and allowed to, function as designed. There is no real need to restructure.

The mandate to jointly formulate war plans by the three Service chiefs must stem from the COSC, with the Service chiefs jointly setting up mandatory processes that make it incumbent on their staff and commands to jointly evolve integrated plans. The COSC needs to lay down the framework, forum, information formats, methodology and guidelines for making integrated war plans and jointly train for their implementation. These have not been laid out or made mandatory till today. The three Service chiefs must ask their respective commands to follow the mandated process and only then forward jointly planned and signed war plans for approval of their Headquarters (HQ). The exact nuances can be worked out at the COSC and translated down to Command HQ in a standardised format. Standardisation at Command HQ is necessary since individual perspectives of senior leaders have a profound effect on the command's judgment and influence inter-Service integration. Guidelines must underline the need to empathise with members of the other Service and solve contentious issues through logic, mutual trust and understanding. Such an approach would further strengthen the Indian system. It ought to be appreciated that at the tactical level of operations, the three Services work together extremely well and without friction. With the right framework and attitude developed and implemented by commanders at the apex level, the commanders in the field would find it more conducive to work and train jointly with units from the other Services to ward off threats that our belligerents may pose in an actual war.

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### **THE BELLIGERENTS**

Our belligerents lie conjoined on our western and northern borders and could threaten us individually or in collusion / support of each other. This situation is typical to India. The nation would need to realise that only a single integrated strategy would ward off a combined threat for which singularity of command would be essential at both the political and military levels, even though we would be waging a war on two fronts against two nations. Such a structure, where the country is seen and treated as one theatre, would be best suited. Forces could be moved at short notice between geographical spaces, with one central agency assuming command and control. This way, the forces would respond faster to meet war objectives unimpeded by theatre issues. To adapt and respond faster than either adversary would be the key to winning a collusive two-front or a single front war.

### **CONCLUSION**

Conceptually speaking, the inherent idea of a theatre relates to vast land and sea areas, with stretched lines of communication, requiring integral forces, spaced out from adjoining theatres so as not to be influenced and emerge as a complete whole. Ours is but a small sized country: with smaller lines of communication, making relocation of forces feasible, theatres would be adjoining, bearing operational influence on each other, and robbing them of operational independence. In this perspective, the idea of carving out theatres is fundamentally flawed. Our size, the indivisibility of the air force, limited conventional and sub-conventional wars, and the disposition of our enemies compel us to be structured and viewed as one theatre, a complete whole employing one strategy against enemies in collusion or support.

Joint planning is fundamental to evolving an integrated war plan and this cuts across all militaries around the world, irrespective of the structure of their armed forces and even that of integrated commands. In our present system, the onus of joint planning is on the three Service chiefs and the system has worked well, as demonstrated in the full scale Indo-Pak War of 1971 and the limited Kargil imbroglio. Should we restructure a system that has always worked for us only because of the imagination and visualisation

of its propagators that leads them to believe that it would not work again? Or is it their superhuman crystal ball gaze into the future that can foresee our defeat in future wars? Should we succumb to such absurdity which comes without any fundamental purpose? Implicit in the creation of Theatre Commands is the division of our woefully short air force assets, thereby creating an asymmetry in favour of the enemy. With the air force divided into various theatres, it is weaker than the enemy in each theatre and when tied to a single theatre's operational plans, it would not be able to provide the requisite air defence across any theatre owing to lesser numbers. Weakened air defence will allow the enemy to take control of the air and interfere with our surface operations, much to our peril. For the air force to remain a viable and effective force capable of fighting a two-front war, its employment needs to be centrally orchestrated and multiplexed across fronts/ theatres / our geographic war space. Such employment would be essential and critical to winning the next war. Any division into Regional Commands would be detrimental to such employment as theatre commanders would not part with air assets for use in another theatre. The less a nation can afford, the more carefully it must utilise what it has. This statement is what sets the tone in our unique case. Hence, dividing the air force into Theatre Commands is not an operationally sound idea and does not suit our nation. It is a sure shot recipe for disaster.

And, finally, it needs to be appreciated that integration and jointness are not implicit in creating Integrated Theatre Commands. In our case, it may not even fetch operational dividends. Being joint implies closely working and cooperating with the other Service, with the right attitude and behaviour primarily of the seniormost military leaders. Therein lies the real crux of the problem. Behaviour which maximises the capability of a part of an organisation at the expense of the whole is dysfunctional. The idea of dysfunctional Theatre Commands does not suit India.



# INTEGRATED OPERATIONS: MORE THAN JOINTMANSHIP

ASHMINDER SINGH BAHAL

*There are experts of land, sea and air power, but as yet there are no experts of 'warfare', and warfare is a single entity, having a common purpose.*

— Giulio Douhet

## INTRODUCTION

The consequence of the sociological revolution and the commencement of the industrial revolution took place in the shape of creating large standing professional armies that trained and fought together. The Napoleonic wars epitomise the same. It was here that the first seeds of jointmanship were sown. What is joint? 'Joint' implies a place or a thing at which two or more parts of a structure are joined. The word 'jointmanship' does not exist in the English dictionary, but is in considerable use in the armed forces to signify superior cooperation. It conveys a feeling of mutual collaboration for synchronisation of all components of military power to achieve a common military objective.

The US Joint Doctrine explains jointmanship as “to coordinate the combat capabilities of the Services, allies or coalition partners to achieve the greatest possible military advantage. This is accomplished through creation and execution of plans, which maximise the unique capabilities of each Service”.

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**Jointmanship is the systematic progression of the propagated war principle of cooperation and aims at synergistically combining the operations of the armed forces towards achieving common joint objectives.**

Jointmanship, therefore, is the systematic progression of the propagated war principle of cooperation and aims at synergistically combining the operations of the armed forces towards achieving common joint objectives. One of the oft quoted remarks in the armed forces today is that more than jointmanship, what we need is integration. What is the delicate difference between the two?

#### **JOINTMANSHIP AND INTEGRATION: THE SUBTLE DIFFERENTIATION**

Integration, as per its literal meaning, implies amalgamation, incorporation, unification, consolidation, merger, fusing, blending, meshing, homogenisation and assimilation. Integration is complete when all the components of an organisation such as the armed forces, function as an integrated whole, function as a single entity, with a unified mission and direction, whilst retaining independent functioning of each limb, depending upon the limb's competencies and capabilities to undertake a particular function most effectively.

Integration inherently includes the following elements: synergy, synchronisation, simultaneity and fusion. The term '**synergy**' implies that the final output produced by the three Services should be significantly larger than the sum produced by each individual component. However, true synergy is obtained only if each of the parts is strong and competent enough on its own and in its own right.

Integration is not about fighting a war where every Service is given an equal chance to contribute in combat operations meaningfully—it is about recognising that each Service has its own unique competencies and strengths and if the capabilities and unique competencies of all are combined appropriately and utilised commensurate with the situation and opportunity, then the strategic objectives may be achieved most effectively and efficiently, with least damage to self and others.

Integrated operations are promoted by two crucial elements: first, a seamless environment that promotes integrated operations; and second, 'flexible mindsets' that allow integrated planning and synergised and synchronised war-fighting to take place, and that these operations originate from a carefully conceptualised integrated joint plan. An important aspect here is that it is more important to jointly plan for integrated operations. Let us take a look at the battlefields of the future and their integration requirements.

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#### **FUTURE BATTLEFIELDS AND NATURE OF WARFARE**

The battlefields of the future are likely to be digitised, networked and seamlessly integrated. The fusion of advanced ground, air and space-based systems would result in greater transparency, increased mobility, enhanced reach and accuracy and enlarged areas of influence. Integrated with a net-centric environment, they would require flatter command and control structures that enhance speed of command and response, and reduce sensor-to-shooter time, thereby significantly increasing overall combat capability. Perhaps, one may have to resort to such type of coordination where there is no single conductor centrally directing tactical operations, but the executing functions are conducted by a core group that is geographically dispersed and operating perhaps more autonomously to exploit fleeting opportunities under a common guidance.

Yet, wars fought for territory would slowly lose their meaning in an economically linked global world order and also while operating under nuclear thresholds. Consequently, destruction of the enemy's military power may not remain as relevant in the future.

**The future military leaders may have to contend with a faceless enemy, high tensions, greater fatigue levels, increased media glare, and no clearly defined agenda.**

Even this assumption has been challenged in the heightened tensions that have increased between North Korea and the international community that includes the US, Japan and South Korea, where, after North Korea's sixth and most powerful nuclear test on September 3, 2017, additional UN sanctions have been imposed. North Korea has threatened the use of nuclear weapons to "sink" Japan and reduce the United States to "ashes and darkness" for supporting a UN Security Council resolution. A dictator, fanatic or an inexperienced and unwise leader could completely change the war dynamics and the methodology utilised in the conduct of war.

The scenario in the future may also include the increasing threat posed by the non-state actors and terror organisations propagating their own form of *jihad*. The future military leaders may have to contend with a faceless enemy, high tensions, greater fatigue levels, increased media glare, and no clearly defined agenda. They would also need to develop unconventional responses to diverse threats that range from high intensity conflicts fought under nuclear thresholds to challenges posed by terror organisations.

The threats may not necessarily be only military ones, but may emerge from internal instability, lack of social cohesion, communal pogroms, inequitable growth, expansion of divisive forces exploiting region, religion and language fault lines, natural disasters, environmental degradation, criminalisation of society, food security, water issues and poor governance.

The existing state-centric approach that was confined to preparing defence against territorial aggression is currently widening to include the idea of comprehensive security, which includes a larger set of threats to the people<sup>1</sup>. The threat spectrum could include food, energy and human security too.

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1. Gopalji Malviya, "Dialectics of Governance and Comprehensive Security in India", in Gautam Sen, *Conceptualising Security for India in the 21st Century* (Delhi: Atlantic Publishers and Distributors (P) Ltd., 2007), p. 23.

The impact of technology is already demanding innovative operational concepts to fight a high-tech knowledge-based war that is based on a wide variety of threats, both internal and external. This places a premium on the military and aerospace leadership.

Space-based assets are likely to play a key role in enhancing the combat effectiveness of air and surface operations. Aerospace power has, therefore, currently become the primary instrument of choice and would play a dominant role in future warfare.

There would be enhanced reliance on a wide variety of sensors for obtaining information and creating battlefield transparency. The electronic networking between the operational commands of the three Services has become indispensable and the extent of integration would determine the difference between success or failure in integrated operations.

The futuristic sixth generation aircraft would have enhanced capabilities of reach, persistence, survivability, stealth capabilities and net-centricity that leads to high situational awareness, human system integration and long range all weather precision weapons. The future aerospace assets would also need to operate in an advanced Electronic Warfare (EW) scenario, against transparent integrated Air Defence (AD) systems, work in a passive detection environment, operate in an advanced cyber attack capabilities scenario, and be able to survive in an anti-access/area denial environment. The game changers in the future would be directed energy weapons, hypersonics, photonics and unmanned combat aerial vehicles.

With increased globalisation, the existing power concepts have moved away from capture of territories to extracting political/economic concessions; from attrition oriented warfare towards the effects-based approach to operations, where more than physical destruction of the target systems, functional paralysis is desired.

**Space-based assets are likely to play a key role in enhancing the combat effectiveness of air and surface operations. Aerospace power has, therefore, currently become the primary instrument of choice and would play a dominant role in future warfare.**

**Warfare itself may be more knowledge-based and focussed on achieving strategic success quickly by following the Centre of Gravity (COG) approach rather than causing physical destruction of the target system or annihilation of the armed forces.**

The aim now is to isolate the enemy's Command and Control (C2) structures, augment psychological warfare and strike deep inside the enemy's territory on his crucial vulnerabilities with precision. These concepts favour employment of aerospace power.

The importance of temporal advantage in warfare too has been recognised and its relationship with force and space appreciated. From a sequential form, air power today applies force in parallel at all levels of war. The strategic, operational and tactical levels themselves have merged and are related more to functionality than to location or type of targets.

Networking of sensors, operators and decision-makers has resulted in transforming linear warfare to a non-linear form. The increased focus today is on knowledge and effects, and to apply forces synergistically to achieve the desired outcome in the shortest period of time, with the minimum casualties and minimum collateral damage.

Warfare itself may be more knowledge-based and focussed on achieving strategic success quickly by following the Centre of Gravity (COG) approach rather than causing physical destruction of the target system or annihilation of the armed forces. Strategic success would depend on achieving the political aims cost effectively and in the least period of time, whilst remaining within nuclear thresholds.

It is here that the war is likely to be fought more in the moral sphere than in the physical. This essentially implies using doctrines and strategies that focus on targeting those crucial vulnerabilities of the enemy that affect the moral sphere. The physical sphere is related to the fighting power or the means to fight, the mental to the thinking power, and the moral to the staying power<sup>2</sup> or ability to get people to fight.

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2. David S Fadok, thesis presented to the Faculty of the School for Advanced Airpower Studies on "John Boyd and John Warden: Airpower's Quest for Strategic Paralysis", June 1994, Available on [www.fas.org/man/eprint/index.html](http://www.fas.org/man/eprint/index.html).

Concentrated attacks on the physical aspects would normally lead to concentrating mass or firepower on the enemy's fielded forces in an annihilation or attrition strategy. Focussing on the mental aspects would directly affect the strategy itself. On the other hand, the moral sphere is the one that provides the will to continue with the conflict. It is at this level that coercion in any form could make the enemy succumb to our will. Ideally, one should target that part of the physical element that creates the maximum coercive effect at the moral level. Information, knowledge, wisdom and leadership skills are going to play a key role in choosing the correct target systems and in achieving quick strategic success.

All the three Services have their own unique competencies to exploit the battle space, however, it is only aerospace power that has the unique capability to target all the three spheres of wars simultaneously, thereby creating the desired strategic influence much faster than land or naval power can do. Aerospace power has the ability to circumvent the enemy's fielded forces and attack his vital centres of gravity directly and that too with precision, thereby creating strategic outcomes from tactical operations. Aerospace power would, therefore, always have an out of proportion devastating effect.

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## **STRATEGY FOR FUTURE WARFARE**

The strategy for future warfare would need to take into account the following doctrinal principles:

- Wars would need to be fought at the strategic level. There is a need to integrate all elements of national power to achieve national objectives more effectively, therefore, a greater degree of integration would be required at the national level too.

- Warfare should be considered as a single entity and as an integrated whole and should be focussed more on causing strategic/functional paralysis rather than on achieving annihilation/attrition. Identification of centres of gravity would play a key role in formulating strategic and operational art.
- Combinations of conventional and nuclear doctrines need to be factored into the operational strategy. Deterrence thresholds too need to be identified and included in considerations for evolving integrated operational plans.
- The meaning of victory would relate more to achieving strategic success quickly or forcing the enemy to negotiate on favourable terms.
- The operational intensity and momentum of combat operations would need to be kept significantly high so as to continuously destabilise the enemy—physically, morally and psychologically. This implies that there would be very limited time available to plan and coordinate military operations when they are actually taking place. This preparation for different contingencies would have to be carried out during peacetime. The political decisions would need harmonisation and integration continually with the operational progress of war.
- There would be a requirement to significantly enhance and integrate the role of air and space power intimately in the formulation of operational art.
- Air power needs to be strategically employed at the enemy's COG to achieve quick operational and strategic disbalance as well as strategic outcomes. Targeting would become significantly important and would be based on the COG approach.
- Synchronised application of aerospace resources would be synonymous with the creation of a network-centric environment based on key communication nodes. These nodes also become operational vulnerabilities that need protection.

### **INTEGRATED OPERATIONS AND OPERATIONAL ART**

Integrated operations are undertaken to achieve a common or joint purpose. Integrated war-fighting originates from a jointly conceptualised



plan. It is important to mesh the achievement of the objective with the appropriate force that can achieve it in the most effective manner. This force could come from any of the three Services or could be a joint force.

The development of operational art is a complex process and requires commanders to combine knowledge, wisdom, experience and moral courage. Clausewitz called this “the genius of command”. Campaign planning tools help commanders by providing them with a common set of methods, but they should be used with wisdom and judgment. Von Moltke’s observation that “no plan survives contact with the enemy”, is essentially true. An indispensable element of campaign planning is that one must be prepared to be flexible enough to change the plan according to circumstances and situation.

An understanding of strategic and operational art and the campaign planning process is not simply a matter of tactical understanding or executing battlefield checklists; it is the key to achieving strategic success in wars quickly. For this, adequate preparation needs to be carried out during peace-time, with all contingencies planned, evaluated, tested and rehearsed.

What is required is to develop military leaders who have the ability to identify crucial joint war objectives and evolve integrated plans to conduct integrated operations effectively. This would require a very high degree of knowledge of the three Services and the ability to adapt quickly to changed circumstances. A systemic, integrated and composite Professional Military Education (PME) programme, therefore, should ideally be part of an overall integration strategy.

There is an urgent need today to train the armed forces’ officers to clearly understand the complex whole of warfare and be able to bring integration in evolving joint war-fighting strategies at all levels of war. This implies

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**The PLA is likely to utilise the War Zone Campaign (WZC) concept between the theatre and the operational level. It would be based on integrated operations coordinated under a single Joint HQ. WZC uses Rapid Reaction Forces (RRFs) to tackle high value targets.**

not merely understanding the mechanics of how one's own Service fights, but also the core competencies, capabilities and abilities of the other Services and how they fight, what their sensitivities are, and what is required to ensure that their operations can be carried out most efficiently and effectively.

Since the wars of the future would be operating under time constraints, there is a need to shift from tactical orientation of warfare towards creating quick strategic influence to force the opponent to make the desired concessions in the available time-frame. Creation of quick strategic influence necessitates the correct application of synergised and integrated combat power at the most decisive points that give out-of-proportion results. It is here that aerospace power can play a key role in creating strategic outcomes, either on its own or in concert with the other Services and integrated forces. There is a need here to evaluate the impact of integration in the armed forces in our neighborhood and how their integration would impact our operational strategies.

#### **INTEGRATION IN PLA'S ARMED FORCES AND OPERATIONAL CONCEPTS: A REVIEW**

China's People's Liberation Army's (PLA's) operational strategy has presently moved away from one of annihilation and independent action to that of attaining strategic success in an integrated environment. They view the primary threat to be local, and that future wars would be fought with leaner but highly trained and mobile integrated forces using high technology weapon systems.

The PLA aims to cause strategic and operational paralysis by attacking the crucial vulnerabilities of the opponent, including his space, information and computer systems. Air and missile power, employing

long range precision weapons, would be one of the key components of this strategy. China also follows the 'anti-access' strategy to deny the adversary access to his planned launch pads so as to prevent build-up of forces till the PLA is able to react better. It seeks to achieve this aim through attacks against air bases and ports and elements of the logistics chain as well as on information systems to degrade the enemy's command and control structure.<sup>3</sup>

This change from Joint Operations (JO) to Integrated Joint Operations (IJO) took place post 2002, when the PLA shifted the emphasis to local wars fought under informationalised conditions. While JO emphasised on 'jointness' within the Service, with vertical linkages, IJO looks at 'jointness' with the other Services, hence, lays greater emphasis on horizontal linkages<sup>4</sup>.

The PLA is likely to utilise the War Zone Campaign (WZC) concept between the theatre and operational level. It would be based on integrated operations coordinated under a single Joint Headquarters (HQ). WZC uses Rapid Reaction Forces (RRFs) to tackle high value targets. Part of the WZC is the employment of "Elite Forces and Sharp Arms (EFSA)" concept. The limited nature of future local wars ensures that it is possible to achieve local and temporary superiority with the concerted employment of EFSA.

The Chinese have, therefore, acquired high-tech elite forces with sharp arms so as to undertake operations in areas close to the mainland. This could also include mountain passes or enemy air bases (as tasks for its RRFs). This would be possible with a centralised logistics base and appropriate weapon systems. This would also imply the ability to mobilise quickly with the help

**Part of the War Zone Campaign is the employment of "Elite Forces and Sharp Arms (EFSA)" concept. The limited nature of future local wars ensures that it is possible to achieve local and temporary superiority with the concerted employment of EFSA.**

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3. Gurmeet Kanwal, "China's Emerging War Concepts". Accessed from the site <http://www.vifindia.org/article/2012/august/21/china-s-emerging-war-concepts> on October 7, 2012.

4. Mandip Singh, "Integrated Joint Operations by the PLA: An Assessment", December 11, 2011. Accessed from the site [http://www.idsa.in/idsacomments/IntegratedJointOperationsbythePLA\\_msingh\\_111211](http://www.idsa.in/idsacomments/IntegratedJointOperationsbythePLA_msingh_111211) on October 7, 2012.

**The PLAAF has also adopted the “light front, heavy rear” approach, thereby emphasising quick aggressive attacks with strong air defence. PLAAF missions include air coercion, air offence, blockade and close support.**

of civilian assistance, rapid deployment, effective coordination and integrated command.

As regards the PLA Air Force (PLAAF), its aim is to “win decisively” rather than defeat the enemy by strength. It plans to focus on striking first, and thereafter, undertaking swift attacks to achieve highly successful results whilst maintaining close defence. The PLAAF will aim to stop attacks by alienating the attacking force from its parent organisation.

The PLAAF has also adopted the “light front, heavy rear” approach, thereby emphasising quick aggressive attacks with strong air defence.

PLAAF missions include air coercion, air offence, blockade and close support. Structural reforms have revamped the organisational structure, while operational reforms have equipped it with the weapons and firepower needed in the new scenarios<sup>5</sup>. This approach implies that the rear bases would be utilised to launch offensive air missions, and the forward air bases for refuelling and rearming till the air power of the enemy is degraded to the desired extent.

In defending China’s core national interests, PLAAF capabilities, doctrine and training have been developed to support a comprehensive anti-access/area-denial strategy. The Chinese concept of active defence as well as the recently modernised PLAAF capabilities, doctrine and campaign planning have predisposed the PLAAF towards this approach.<sup>6</sup> New establishments have significantly reduced the earlier weak areas in training and testing.

In 2012, the PLA had carried out four major integrated military operations in the Tibet region. The exercise participants included both the PLA and PLAAF. A number of fighter jets and helicopters participated

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5. Air Mshl M Matheswaran, Lecture, “PLA Air Force”, at IIT Madras, Chinese Centre, October 27, 2011. Accessed from the site <http://www.csc.iitm.ac.in/?q=node/91> on October 7, 2012.

6. Michael P Flaherty, *Red Wings Ascendant: The Chinese Air Force Contribution to Anti-Access* (NDU Press). Accessed from the site <http://www.ndu.edu/press/red-wings-ascendant.html> on October 7, 2012.

in the exercise. In July 2012, the PLA tested its new surface-to-air missile in Tibet<sup>7</sup>. The missile was tested in the Lanzhou Military Region (MR). The exercise was carried out at 5,000 m altitude and three missiles were successfully test-fired at aircraft targets. The unit gathered technical data relating to storage and maintenance of equipment, system coordination and troop mobility<sup>8</sup>.

Weapon trials firing was also carried out in an integrated exercise. The ground crew fuelled fighters and loaded ammunition at temperatures below -20<sup>0</sup> C and undertook strikes with conventional and laser guided bombs by day and night<sup>9</sup>. The J-10 aircraft took part in joint exercises in October 2011 too, incorporating air forces and air defence units as well as armour and artillery units in the Tibet Autonomous Region<sup>10</sup> (TAR).

Two Group Army (GA) level joint exercises were carried out in the Chengdu and Lanzhou MRs. The objective was to have a division sized force practise in an integrated environment that involved armour, artillery and PLAAF units. Network-centric operations in an intense electromagnetic environment in conditions of informationalisation were also practised<sup>11</sup>.

Recently, China operationalised Nyingchi, a dual use airfield in Tibet, very close to the Line of Actual Control (LAC). Earlier, the PLAAF utilised two divisions based at the erstwhile Chengdu MR, by operating small detachments of six or even less aircraft in the TAR. The deployment number and period have since seen a significant increase. The PLAAF is now virtually

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7. Air Warfare News, "PLA Conducts Major Military Operation in the Tibetan Autonomous Region", August 17, 2012. Accessed from the site <http://www.chinesedefence.com/pla-conducts-major-military-operation-tibetan-autonomous-region-298/> on October 24, 2012.
  8. Bijoy Das, "PLA Conducts Missile Tests in Tibet", IDSA Comment, July 30 2012. Accessed from the site [http://idsa.in/idsacomment/PLAConductsMissileTestsInTibet\\_BijoyDas\\_300712](http://idsa.in/idsacomment/PLAConductsMissileTestsInTibet_BijoyDas_300712) October 24, 2012.
  9. "PLAAF Exercise in Tibet", April 25, 2012, Security Issues South Asia, China in South Asia. Accessed from the site <http://www.security-risks.com/security-issues-south-asia/china-in-south-asia/plaaf-exercise-in-tibet-1588.html> on October 24, 2012.
  10. PFI, "China Conducts Massive Border Drill", March 22, 2012. Accessed from the site <http://defenceforumindia.com/forum/china/33402-china-conducts-massive-border-drill.html> on October 24, 2012.
  11. Vinod Anand, "PLA Sharpening its Claws in Tibet", Vivekananda International Foundation. Accessed from the site <http://www.vifindia.org/article/2012/july/06/pla-sharpening-its-claws-in-tibet> on October 24, 2012.

maintaining two regiments that comprise the J-10 and J-11 aircraft continually at the TAR, even in the winter months.

Amidst the Doklam standoff in July 2017, the official news agency of China reported that the PLA had conducted live firing exercises at 5,000 m altitude on the Tibetan plateau. The exercises were conducted by a PLA brigade and included rapid deployment, multi-unit joint strike and anti-aircraft defence<sup>12</sup>. The exercise effectively tested the brigade's joint strike capability on plateaus<sup>13</sup>.

Though not confirmed, media reports also indicated that the drills that involved the testing of new equipment were conducted to evaluate the combat readiness of the troops at these altitudes. The firing exercises included simulation of combat operations, comprehensive inspection of arms integration, encounter training and combat synergies<sup>14</sup>.

The above analyses clearly indicate that the PLA has taken it as its prime mission to bring about integration in the armed forces and that it is training for the same. In addition to the infrastructure construction in the TAR, the PLA is also looking at increasing the ability to deploy and employ integrated forces quickly as well as making operational planning more joint, anywhere and in any contingency.

In this, it would employ the missile and rocket forces too, so as to bring in synergy in operations and create strategic outcomes. The effectiveness of these integration measures can only be guessed, but that dedicated efforts towards the same have been made is of serious concern to us. Let us now analyse our efforts towards integration.

## **INTEGRATION OF INDIAN ARMED FORCES**

After the Kargil War of 1999, a sharper focus towards creating jointness

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12. KJM Verma, "Chinese Army Conducts Live-Fire Drills in Tibet Plateau Amid Sikkim Standoff". Accessed from the site [Chinese-Army-conducts-live-fire-drills-in-Tibet.html](#) on September 16, 2017.
  13. Franz-Stefan Grady, "Amid China-India Border Stand-Off: China Holds Military Exercises in Tibet". Accessed from [amid-china-india-border-standoff-china-holds-military-exercise-in-tibet](#) on September 16, 2017.
  14. Mohammad Uzair Shaikh, "Amid Sikkim Stand-off, Chinese Army Conducts Military Exercises Simulating Battle Scenarios". Accessed from the site <https://www.google.co.in/search?q=military+exercises+tibet+in+2017&ei=T2u8WaDcBZaSvQSA3J64CA&start=10&sa=N&biw=1366&bih=673> on September 16, 2017.

among the three Services and integrating them with the apparatus of the higher defence organisation was commenced with the recommendations of the Kargil Review Committee and a ministerial review by a Group of Ministers. Soon, however, it lost steam as more important issues took centre-stage. There are three crucial issues that need consideration.

Firstly, defence planning needs the guidance of a well articulated National Security Strategy (NSS) and National Military Strategy (NMS). Secondly, the three Services need to evolve their plans at the strategic and operational levels based on a jointly conceptualised threat environment, where clearly defined strategic objectives are obtained from the *Raksha Mantri's* directive or from the strategic situation, whilst keeping in mind the resources and capabilities available. It should definitely not be solely based on the individual threat perceptions of the three Services.

Thirdly, the approach of defence procurement needs to have a holistic vision of at least 15 years [based on the Long-Term Integrated Perspective Plan (LTIPP) with capability building as its core enterprise] and also based on the long-term threat perceptions and the capabilities required to be built to tackle the variety of threats with a systematic induction of the desired capabilities at appropriate intervals—not incrementally adding on to the technology and weapons systems in an ad hoc manner.

Whilst undertaking joint planning, the strategic decision, the determination of a clear political and military end state, and the planning for integrated strategic and operational art need an interface among the political establishment, bureaucracy and armed forces. The first structure is that of the Ministry of Defence (MoD). It is here that the Service HQ must be completely integrated within the MoD.

An Integrated Defence Staff (IDS) structure was put in place by the amalgamation of the Directorate General of Defence Planning Staff and the

**In addition to the infrastructure construction at TAR, the PLA is also looking at increasing their ability to deploy and employ integrated forces quickly as well as making their operational planning more joint, anywhere and in any contingency.**

**An Integrated Defence Staff (IDS) structure was put in place by the amalgamation of the Directorate General of Defence Planning Staff and the Military Wing. It began functioning from October 2001.**

Military Wing. It began functioning from October 2001. HQ IDS has achieved considerable progress since then; however, its integration with the MoD is still to be carried out.

Since the Kargil War, significant effort has been focussed towards jointly appreciating the threats and preparing joint plans. However, we need now to move away from overlays of individual Service plans towards preparing integrated and joint plans that focus on integrated operations that help achieve political objectives under multiple and variable combat situations

most effectively and efficiently.

The appropriate combat power can then be applied to meet the contingency at hand; here, it does not imply equal or maximum application of land, air and naval forces, but the required type and mix of forces that achieves the desired outcomes in the most cost-effective manner, without causing needless death and destruction. The focus should be more on capability applied that is required to achieve the situational objectives rather than on giving an equal/proportionate share to the individual Services.

The key ingredients of integrated operations are synchronisation and fusion of different elements of surface and air power so that their effects complement and reinforce each other. Integrated operations view the entire battle space as a seamless environment, where this fusion is complete.

This fusion would place a premium on providing interoperable systems as well as making available a common backbone for secure communications. Simultaneity of engagement and increased tempo of operations also entail the requirement of a joint architecture that enables allotment of a specific mission to an appropriate force.

Integration at the architectural level requires knitting interoperability into the Command, Control, Communications and Intelligence (C3I) networks of the Indian Air Force, Indian Navy and Indian Army. There is a pressing need today to make these architectures interoperable and seamless.



The focus should be more on capability and competency that are required to achieve situational objectives in an integrated environment, rather than on giving an equal/proportionate share to the individual Services. For this, an integrated PME programme is needed that prepares military leaders to be able to visualise warfare as a whole and as a single entity at all levels of war.

### **INTEGRATED PROFESSIONAL MILITARY EDUCATION (PME) PROCESS**

To achieve the requisite degree of integration an effective integrated PME process is required. Unfortunately, integration in our country is related more to ownership. We need to first change this mindset from ownership to trust that the asset or the weapon system would be applied based on the situation or the opportunity at hand.

A systemic, integrated and composite PME programme should ideally be part of an overall integration strategy. The end result aimed at should be to train officers to comprehensively understand the complex whole of warfare and be able to employ jointness in the war-fighting strategy at all levels of war.

The purpose of military training, therefore, should be to prepare every member of the armed forces to undertake the war-time functions efficiently and effectively by providing them with appropriate and timely knowledge and skills, not only of their own arms and Service but also those of the other Services during the course of their careers.

This process should have twin objectives: firstly, to develop individual skills appropriate to the job at hand; and, secondly, to develop skills required not only to undertake higher responsibilities, but also those that are essential to design integrated operational strategies employing joint application of the land, air, space, information and naval forces.

What is required is to develop future military leaders who have the ability to identify crucial joint war objectives and evolve joint and integrated plans to conduct integrated operations effectively.

**What is required is to develop future military leaders who have the ability to identify crucial joint war objectives and evolve joint and integrated plans to conduct integrated operations effectively.**

#### **EXISTING LIMITATIONS**

The following limitations constrain effective development of military leadership qualities:

- **Exposure at Operational/Strategic Level:** It is at around 25-30 years of service that an armed forces officer steps into the operational level and he then has around ten years of service left to function at the operational and strategic levels. The tenures at the higher levels are so short that there is very little time for researching and learning on the job, besides learning about the

other Services.

There is, therefore, a need for a structured integrated leadership development initiative to enhance joint operational/strategic skills right through the career of a military leader.

- **Integrated Doctrines and Standard Operating Procedures (SOPs):** There are no joint manuals that discuss war-fighting as a whole with a campaign perspective and integrated application of the three Services as part of a joint plan.
- **Manner of Instruction:** Presently, training academies are focussed more on rote memorisation. Hence, they focus on the cognitive sphere, which is essentially related to acquiring domain knowledge. This also implies that they are less likely to provide awareness on integrated operations.

There is a need to focus more on the experiential form of learning that promotes identifying innovative solutions to complex problems and developing strategies integrating the application of the three Services.

- **Joint Appointments:** The exposure provided whilst holding diverse appointments leads to developing joint strategic skills. Presently, it is not mandatory for an officer to hold an inter-Services appointment. There is a need to ensure that an officer, during his entire service career, holds at least one joint appointment.

- **Integrated Computer War-gaming Exercises:** There is no periodic jointly conducted computer aided war-gaming exercise to analyse integrated operational plans or practise simulated situations in a joint scenario.
- To sum up, the following limitations prevail in the integrated training process:
- Most of an officer's career (around 25 years plus) is spent at the tactical level. By the time an officer reaches the star ranks, he has already developed strong mindsets, opinions and perceptions.
  - There is no structured integrated leadership development initiative that identifies the core joint areas where knowledge must be imparted to an officer on joint operations and the stages in the career of an officer, when it must be given.
  - It is not mandatory for all armed forces officers to undergo the desired joint and integrated courses.
  - Detailing of officers for joint appointments is based more on administrative convenience.
  - There is no integrated in-Service institution that develops joint war-fighting strategies and doctrines.
  - Structurally, there is no link between the integrated courses of instruction and transition to higher ranks.
- There is, therefore, a requirement today to have an integrated planning and training process as a first step towards effecting increased integration that works towards providing the right platform for enhancing the effectiveness of integrated military operations.**

## PROPOSED SOLUTION

To overcome the existing limitations, the following recommendations are made:

- Institutionalise an integrated leadership development initiative. This involves identifying an integrated training process that lays down the core capabilities, skills or joint exposure that need to be achieved by military

personnel at different stages of their careers to be able to effectively plan and conduct integrated operations at different levels of war.

- Review the courses of instruction to ensure that an officer undergoes at least one integrated course at the tactical, operational and strategic levels.
- Make it mandatory for an officer to hold at least one joint appointment before he is considered for a two-star post.
- Review the training syllabi of the integrated courses to enhance their joint content. This process has already started.
- Hold periodic joint computer aided as well as actual war-games to provide integrated training and develop operational and strategic skills. This also implies that integrated war-gaming software would need to be developed.
- Change the focus of instructional methodology from classroom teaching towards learning through an experiential process.
- Promote self-development learning through non-resident programmes with short contact periods on integrated courses to give broad exposure to a larger number of officers.

## CONCLUSION

Future wars are likely to be highly complex and would require innovative operational concepts that integrate the application of appropriate combat power. This would require a clear understanding of warfare as a whole and effective understanding of the strengths and limitations of each Service. There is, therefore, a requirement today to have an integrated planning and training process as a first step towards effecting increased integration that works towards providing the right platform for enhancing the effectiveness of integrated military operations.

To achieve the desired integrated training at the tactical, operational and strategic levels, there is a requirement to evolve an integrated leadership development initiative that is supported top down and encouraged bottom up. There is also a need to make it mandatory to attend joint courses and hold a joint appointment for progression to the higher ranks.

The time has now come for us to progress from talking about jointmanship to actually putting integration into practice.

If you tell me, I'll listen  
If you show me, I'll see  
If I experience it, I'll learn.

– Lao Tse, 430 BC.

# COMBATING HYBRID THREATS: A HOLISTIC STRATEGY

ARJUN SUBRAMANIAM  
NAISHAD PUROHIT

*Open war is fighting at the place and time indicated; creating fright, sudden assault, striking when there is error or calamity, giving way and striking in one place are types of concealed warfare; that which concerns secret practices and instigations through secret agents is the mark of silent war.*

— Chanakya, *Arthashastra*<sup>1</sup>

## INTRODUCTORY LANDSCAPE

Globalisation has changed the way wars are fought. Today's emerging paradigm is reflected by the experiences in Afghanistan, Iraq and most recently in Ukraine. The Russian actions in Crimea have brought the subject of hybrid war into sharp focus. It has generated an intense debate around the world about what constitutes a hybrid war, since there have been varied versions proposed by various actors. One could possibly argue that the Russian "New Generation Warfare" (NGW) which Russia tested and perfected in Crimea, is a continuation of its

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1. Chanakya, *Arthashastra*, 7.6, 40-41:p. 342.

**In fact, it is the unprecedented level of connectivity afforded by today's information age that gives so much power to the hybrid methods of warfare. The authors of the Pentagon's 2006 Quadrennial Defence Review recognised the shift, concluding, "In the post-September 11 world, irregular warfare has emerged as the dominant form of warfare confronting the United States."**

very own *Maskirovka* (Russian military deception). However, this NGW may already be termed as an evolved version of the present Western views of hybrid conflict in which low-end hidden state involvement is combined with high-end, direct superpower intervention.

One of the most widely accepted definitions of hybrid war has been proposed by a noted expert, Frank G. Hoffman. He defined hybrid war as a conflict in which states or non-state actors (with or without state sponsorship) exploit all modes of war simultaneously by using advanced conventional weapons, irregular tactics, terrorism, and disruptive technologies or criminality to destabilise an existing order. These multi-modal activities can be

conducted by separate units or even by the same unit, but are generally operationally and tactically directed and coordinated within the main battle space to achieve synergistic effects in the physical and psychological dimensions of the conflict.<sup>2</sup> In fact, it is the unprecedented level of connectivity afforded by today's information age that gives so much power to the hybrid methods of warfare. The authors of the Pentagon's 2006 Quadrennial Defence Review recognised the shift, concluding, "In the post-September 11 world, irregular warfare has emerged as the dominant form of warfare confronting the United States."<sup>3</sup> This shift is significant as it begins to broaden the scope to sharpen our focus on this increasingly likely form of warfare. The blurring of modes of war, the blurring of who

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2.. Frank G. Hoffman, "Conflict in the 21st Century: The Rise of Hybrid Wars", Naval Institute Proceedings, November 2005.

3. Quadrennial Defence Review, Washington DC, March 2006. p. 36. Accessed at <<http://archive.defense.gov/pubs/pdf/QDR20060203.pdf>> on 10 July 10, 2016.

fighters, and what technologies are brought to bear, produces a wide range of variety and complexity that we call hybrid warfare<sup>4</sup>.

Apart from attempting to analyse the evolution and characteristics of hybrid threats, along with their implications in the Indian context, this article seeks to offer ideas to address the dilemma of understanding and building capability to combat hybrid threats primarily from an Indian perspective. Detailed analysis of hybrid threats would clearly bring out that there is hardly any original and extensive research on its characteristics and attendant consequences from an Indian perspective. Hybrid war puts a premium on strategic outcomes and not on the tactical results. This also goes on to show that a hybrid adversary is always victorious unless he is decisively defeated. Defeating a hybrid adversary essentially entails alienating him from the support structure that he enjoys amongst the local populace, without which it is very difficult to defeat him on a permanent basis. This explains the strategic aspect of defeating a hybrid adversary.

In this context, evolved joint structures to tackle 21st century threats are of utmost importance. This would ensure that the Indian armed and security forces would be able to deal with a spectrum of challenges with trademark professionalism. However, this would be possible only after the necessary structural reorganisation at an appropriate level. It may be of interest to note that on April 16, 2016, the European Commission too adopted a joint framework to counter hybrid threats and foster the resilience of the European Union (EU) and its member states. This framework would pave the way for setting up an EU Hybrid Fusion Cell that would focus on analysis of hybrid threats.

### **HYBRID SECURITY IMPLICATIONS FOR INDIA**

If there has ever been a time in history when military strategist Frank Hoffman's statement that "the incentives for states to exploit non-traditional modes of war are on the rise"<sup>5</sup> was true, then today is that time. India has long

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4. Lt Gen James N. Mattis USMC, Naval Institute and Marine Corps Association, September 2005. Accessed at <<http://milnewstbay.pbworks.com/f/MattisFourBlockWarUSNINov2005.pdf>> on December 11, 2016.

5. Frank G. Hoffman, "Hybrid Warfare and Challenges", March 2009, p.38. Accessed at <<http://www.smallwarsjournal.com/documents/jfqhoffman.pdf>> on July 24, 2016.



**The long-standing proxy war waged by Pakistan against India in J&K is a classic example of hybrid war. The conflict has brought to the forefront the ability of proxy actors to study and deconstruct the vulnerabilities of conventional military forces.**

standing territorial disputes with Pakistan and China – both nuclear weapons armed states. Indian held territories opposite Pakistan and China have peculiarities that can be exploited by an adversary desirous of fighting a hybrid war. The long-standing proxy war waged by Pakistan against India in Jammu and Kashmir (J&K) is a classic example of hybrid war. The conflict has brought to the forefront the ability of proxy actors to study and deconstruct the vulnerabilities of conventional military forces. Mixing an organised political movement with decentralised cells employing adaptive tactics in ungoverned zones, outfits like the Lashkar-

e-Tayebba (LeT) and Jaish-e-Mohammad (JeM) have shown that they can inflict, as well as take, punishment. Though not as potent or well trained as the Hezbollah are known to be, they compensate with greater fanatic zeal and irrationality. Taking the J&K proxy war as a case study, some hybrid warfare scenarios involving multiple domains that might unfold in the future are highlighted below. India would need to be prepared with flexible and suitable response mechanisms to counter them.

As far as China is concerned, a futuristic hybrid war could well begin with economic underpinnings. Sustained and deliberate dumping in traditional markets in neighbouring countries like Nepal, Bangladesh, Afghanistan and Myanmar could well mark the commencement of tension. While the consolidation of the China-Pakistan Economic Corridor (CPEC) and the string of bases in the Indian Ocean Region (IOR) may not be considered direct military threats, they certainly offer a ‘spring board’ for calibrated escalation. Oblique pressure on Indian investments as in the case of ONGC Videsh, would, however, constitute a direct threat to Indian security interests and must be factored into any security matrix.

In the near and medium term, however, the hybrid threat from the Inter-Services Intelligence (ISI) supported proxy and terror networks emanating

from Pakistani soil will remain a grave concern for India's national security planners. Escalation control in the backdrop of the nuclear conundrum, rather than decisive and sustained coercion, will continue to trouble India as it seeks to offer calibrated responses to irrational acts of cross-border terrorism. There are, however, increasing signs from both India's military and strategic leadership that the costs for waging a proxy war against India will rise significantly in the near and medium terms.

An interesting proposition is a collusive scenario between China and Pakistan, which is most likely in the hybrid domain and could revolve around simultaneous pressure being applied across the maritime, land and economic domains and non-traditional areas like 'water wars', with adequate ambiguity. When this is combined with efforts to undermine public perception in troubled spots like J&K, accompanied by a 'virtual and cyber' offensive, it has the potential to severely impact national security. The possibility of a Hezbollah-like modern hybrid challenger emerging from a mix of *jihadis* and Taliban fighters ranged against India cannot be ruled out. Such an entity would demonstrate state-like military capabilities, including the creation of highly disciplined and well trained cadres who would be capable of contesting ground and wills against a modern conventional force. The semi-urban terrain will be meticulously exploited to create ambushes, evade detection and build strong defensive fortifications close to non-combatants, much like the Hezbollah did in 2006.<sup>6</sup>

### **LEARNING FROM THE HEZBOLLAH-ISRAEL CONFLICT**

In this realm, analysing the challenges posed by Hezbollah against the Israeli Defence Force (IDF) may accrue out of proportion benefits to Indian military analysts as far as outthinking a hybrid adversary is concerned. Hezbollah, a best suited example of a modern hybrid challenger, demonstrated several state-like military capabilities. This brings to fore the ability of non-state actors to study and deconstruct the vulnerabilities of conventional military forces.

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6. Andrew Exum, "Hizballah at War: A Military Assessment," Washington Institute for Near East Policy, December 2006, pp. 9-11.

**In the field, Israeli troops grudgingly admitted that the Hezbollah defenders were tenacious and skilled. Hezbollah proved skilfully elusive and deliberately blended into the civilian population and infrastructure. The organised resistance was experienced to be several orders of magnitude more difficult than the counter-terrorism operations in the West Bank and Gaza Strip.**

Hezbollah showed that it could inflict, as well as take, punishment. Its highly disciplined, well trained, distributed cells contested ground and wills against a modern conventional force. The urban terrain was meticulously exploited to create ambushes, evade detection and build strong defensive fortifications near non-combatants.<sup>7</sup> In the field, Israeli troops grudgingly admitted that the Hezbollah defenders were tenacious and skilled<sup>8</sup>. Hezbollah proved skilfully elusive and deliberately blended into the civilian population and infrastructure. The organised resistance was experienced to be several orders of magnitude more difficult

than the counter terrorism operations in the West Bank and Gaza Strip. Hezbollah's use of C-802 anti-ship cruise missiles and volleys of rockets represented a sample of what hybrid warfare might look like.<sup>9</sup> Noteworthy tactical combinations and novel technology applications were resorted to by the defenders. The anti-armour weapons employed against the IDF tanks and defensive positions brought in an element of surprise, specially when coupled with decentralised tactics. To Hezbollah's credit, the IDF was even required to adapt and apply itself innovatively to detect a few armed Unmanned Aerial Vehicles (UAVs) that were launched against them. These included either the Iranian Mirsad-1 or Ababil-3 Swallow<sup>10</sup>.

Despite the severe force asymmetry to its disadvantage, Hezbollah arguably came out of the conflict stronger in ideological appeal as Israel

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7. Ibid., pp. 9-11.

8. Jonathan Finer, "Israeli Soldiers Find a Tenacious Foe in Hezbollah," *Washington Post*, August 8, 2006, p. 1.

9. Matt Hilburn, "Hezbollah's Surprise," *Seapower*, September 2006, pp. 10-12.

10. Anthony Cordesman, *Preliminary Lesson of Israeli-Hezbollah War* (Washington, D.C.: Center for Strategic and International Studies, August 17, 2006), p. 16.

possibly lost the strategic battle of perceptions. Hezbollah exploited the political effects of its limited tactical successes which were further magnified by the media. Hezbollah's combat cells which comprised a hybrid of guerrillas and regular troops also inspired organisations like Hamas in Palestine.

In spite of being tactically defeated on multiple occasions throughout the conflict, Hezbollah was able to take advantage of several critical factors in order to gain an operational and strategic victory. The court of public opinion in Israel, Lebanon and the rest of the world saw Israel as losing the conflict. In this sense, a hybrid force gained clear advantage through synergistic effects over its conventional opponent and achieved a surprise victory. However, it must be noted here that a hybrid force will need to have an abundant "will to sacrifice" as it will inevitably suffer very heavy casualties against a determined and modern military state e.g. the fate of terrorist insurgents in J&K against the Indian Army. To be fair to the IDF though, a thorough restructuring of doctrine and operational processes after the 2006 conflict has resulted in the inability or reluctance of Hezbollah to attempt a 'repeat performance.' In effect, therefore, Hezbollah's success was a one-off event that is unlikely to be repeated against Israel. India would do well to learn from the Israeli experience and stay vigilant for similar trends emerging within the ranks of the *jehadi* forces involved in the proxy war.

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## **TRANSFORMATIONAL RESPONSES**

Transformation of organisational structures, training, equipping, evolution of doctrines and tactics comprise a time consuming and continuous process. But what is important is that the threats are dynamic and so should be the preparation to deal with them. Therefore, in this muddled and foggy environment, what should be the way ahead in the Indian context? A

**An all-pervasive role in this domain is played by the intelligence agencies, which should forewarn, prepare the state security forces for the impending threat, guide them till the target, and give inputs for a change in strategy or stance. Ultimately, what is significant is the preparation and response to an undefined threat.**

multi-layered security mechanism is needed to build a comprehensive security strategy against an ambiguous or undefined threat. For example, counter-terrorism levers are intelligence, military, law enforcement, diplomacy and financial sanctions to deal simultaneously against those operating from within the country or having cross-border linkages. Strategy and doctrine must form the edifice of any conceptual framework to combat hybrid wars, and this must be a joint and multi-disciplinary approach. It must precede any force restructuring. In fact, the first tool of deterrence is defining

and declaring a strategy and doctrine. This is a weak area as far as our own strategic and military work ethos is concerned. Research and capability based strategy and doctrine are required to be defined. This, in fact, lays down what one can broadly expect from the strategic and security establishment.

Success or failure will be dictated by the response mechanism. An all-pervasive role in this domain is played by the intelligence agencies, which should forewarn, prepare the state security forces for the impending threat, guide them till the target, and give inputs for a change in strategy or stance. Ultimately, what is significant is the preparation and response to an undefined threat. A rapid response also means the capability to reach, the capability to operate in an information vacuum, and the capability to handle various contingencies, ranging from conventional to sub-conventional threats.

Understanding the enemy's theory of victory and culture is paramount. This is extremely difficult in a hybrid scenario because the enemy system is complex and adaptive. Additionally, because of the emphasis on the cognitive and moral domains in hybrid war, defining victory in the minds of many different audiences will be a complex and a challenging task. As noted earlier, perceptions matter. Even determining whose perceptions matter is a difficult prospect. "Public Perception" is now the strategic centre of gravity in the

Clausewitzian sense. Russian hybrid methodologies clearly demonstrate an impeccable understanding of this aspect which Russia leveraged so effectively in Crimea. Any serious attempt by a nation-state to counter a hybrid adversary would have to cater to the fact that the practitioners of hybrid warfare always operate within the Observe, Orient, Decide, Act (OODA) loop of the response mechanism of a nation-state. The concept of 'weaponised information'<sup>11</sup> has put it into even sharper focus. Applying this to the Indian context, the first and foremost aim for the Indian armed forces must be to put in place a 'preventive' and 'offensive' mechanism which is capable of responding at a pace faster than the pace at which a hybrid adversary evolves.

### **BROAD OPERATIONAL RESPONSES**

Building joint and combined arms capabilities comprises an inescapable necessity. Cyber war, information war, out of area contingencies and hybrid threats are some of the areas wherein the integration of resources is imperative and must be handled by a domain commander. The inherent nature of hybrid threats requires detailed Intelligence, Surveillance, Reconnaissance (ISR) integration. Intelligence, fires and manoeuvre need to be fused because of the fleeting nature of targets, complex operating environment, dispersed nature of the adversary and the need to limit collateral damage.

The manoeuvre approach merits serious consideration. Manoeuvre in this case is not in the classical manner that revolves around tanks and aircraft, but in the mind. Pitching strength against strength is an outdated concept. Therefore, prudence lies in investing in special forces, with precise capabilities for wide ranging contingencies. Capabilities should be linked to the emerging hybrid threats and challenges. India cannot afford a special force for each domain; therefore, all terrain forces are a must with the future in mind. Special forces should be able to operate within, and beyond the territorial boundaries of India in all three dimensions. They should be lighter, lethal, manoeuvrable, survivable and more readily deployed and employed in an integrated manner. They should also be able to operate seamlessly with

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11. James K. Wither, "Making Sense of Hybrid Warfare, 2016". Accessed at <[http://connections-qj.org/system/files/15.2.06\\_wither\\_hybrid\\_warfare.pdf](http://connections-qj.org/system/files/15.2.06_wither_hybrid_warfare.pdf)> on December 29, 2016.

**Success in hybrid wars requires small unit leaders with decision-making skills and tactical cunning to respond to the unknown and the equipment sets to react or adapt faster than tomorrow's foe. Organisational learning and adaptation would be at a premium, as would extensive investment in diverse educational experiences.**

other civilian agencies during the course of military operations and what are commonly termed as Operations Other than War (OOTW). Combat training centres should incorporate hybrid operations and hybrid opposing forces into training exercises and experiments. Any force prepared to address hybrid threats would place a premium on cognitive skills to recognise or quickly adapt to the unknown.<sup>12</sup> Success in hybrid wars requires small unit leaders with decision-making skills and tactical cunning to respond to the unknown, and the equipment sets to react or adapt faster than tomorrow's foe. Organisational learning

and adaptation would be at a premium, as would extensive investment in diverse educational experiences.<sup>13</sup>

Fighting a hybrid adversary during a conventional war entails employment of modular units and a modular headquarters. Modular headquarters themselves should be more robust and staffed to minimise the requirement for augmentation. They should employ separable and deployable command posts for rapid response.

Air power will retain relevance in hybrid scenarios in both offensive and enabling roles. Precision strikes offer solutions that obviate the necessity for boots on the ground, but that is not to say that air power alone will be the sole response mechanism. Offensive air power assets in conjunction with special forces and robust enabling platforms like Remotely Piloted Aircraft (RPAs), tactical airlift assets for speedy mobility and Combat Search and

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12. David C. Gompert, "Heads We Win: The Cognitive Side of Counterinsurgency, 2007", p. 39. Accessed at <[www.rand.org/pubs/occasional\\_papers/2007/RAND\\_OP168.pdf](http://www.rand.org/pubs/occasional_papers/2007/RAND_OP168.pdf)> on November 1, 2016.

13. David Betz, "A Real Revolution in Military Affairs: Online Continuous Learning for the Operational War-Fighter, October 2007", pp. 5-6. Accessed at <[www.mccdc.maine.mil/Portals/172/Docs](http://www.mccdc.maine.mil/Portals/172/Docs)> on November 19, 2016.

Rescue (CSAR) platforms would form part of a tightly knit response force. Armoured forces based on armoured personnel carriers are key elements of any force that will fight hybrid enemies in semi-built up and urban terrain with a modicum of training, organisation, effective standoff weapons, Improvised Explosives Devices (IEDs) and mines. Light and medium forces can complement armoured forces, particularly in urban and other complex terrain. Fast attack naval craft, along with seaborne special forces, would add significant punch in coastal and riverine battlegrounds. Finally, it has to be acknowledged by two airmen writing this paper that the well-trained and situationally aware infantryman remains the lynchpin in hybrid warfare and needs to be well-clothed, well-armed and capable of switching from operating in large platoon and company strength dispositions, to operating in small teams that somewhat replicate the capabilities of the special forces, albeit with lesser expertise.

While all this discourse about building hybrid capability is fine, India does not have the luxury of debating the diminishing prospects of conventional wars in the future. It is this multi-spectral variety of warfare that hangs like a proverbial dead-weight around the neck of India's doctrinal pundits and strategic planners. Considering the tremendous costs of sophisticated weapons and equipment, the dilemma of equipping for conventional warfare and then adapting oneself to tackle hybrid threats makes great demands on leadership, training and synergy.

### **FOCUSSED STRATEGIES**

Based on current trends and possibilities, the geographical spaces for the conduct of hybrid warfare against India are largely likely to be restricted

**Hybrid war offers no such luxury, particularly when conducting offensive operations against hybrid actors who are embedded among citizens of your own country. These would invariably be based on verified intelligence in the case of preemptive operations and on visible hybrid symptoms in the case of a reactive scenario. The dilemmas, however, are immense.**



to J&K, semi-urban areas along the Line of Control (LOC), limited areas along the Line of Actual Control (LAC) and rapidly changing areas in the northeastern states of Manipur and Nagaland. Historical pointers also suggest that the probability of getting embroiled in an Indian Peace-keeping Force (IPKF) kind of a situation that would warrant a hybrid Out-of-Area-Contingency (OOAC) scenario in support of national interests does exist. In order to simplify the strategies, it is felt that they merely be looked at as offensive and defensive strategies, the targets being both the physical and moral components of an adversary's hybrid capabilities.

What would a broad defensive strategy within the confines of India's physical frontiers look like? This would comprise steps taken to prevent infiltration, regular community searches to identify Anti-National Elements (ANEs), monitoring social media networks and other cyber traffic for suspicious activity, monitoring the flow of illegal and counterfeit currency, cracking down on criminal networks, preventing drug trafficking, investigating cases of missing locals to rule out the possibility of them having joined foreign terrorist organisations, communication intelligence, signal intelligence, perception management, societal awareness and ensuring the presence of multi-tiered physical security for our Vital Assets (VAs)/ Vital Points (VPs). Effectively, these are the operations aimed at creating an environment wherein a hybrid adversary is denied any space or opportunity to wage hybrid war against India.

Offensive strategies in the same space demand speed, discrimination, precision and immense situational awareness to distinguish between friend or foe, or even the ability to discriminate between right and wrong. Traditional military soldiering was not meant to demonstrate the above discriminatory abilities, particularly among the rank and file. As long as the senior leadership was endowed with this ability, operations would go, more or less, according to plan. Hybrid war offers no such luxury, particularly when conducting offensive operations against hybrid actors who are embedded among citizens of your own country. These would invariably be based on verified intelligence in the case of preemptive operations, and on visible hybrid symptoms in the case of a reactive scenario. The dilemmas, however, are immense.

OOAC operations demand competencies and capabilities that are significantly different. Forces would have to switch between defensive and offensive operations within the OODA cycle of the adversary. These would demand joint war-fighting capabilities of the highest order and, hence, this would be discussed in the subsequent paragraphs that deal with command and control structures.

#### THOUGHTS ON JOINT STRUCTURES

Having seen the strategies which are best suited for combating hybrid threats in three distinct categories, let us look at the command and control structures that might prove to be optimal in implementing these strategies.

The challenges faced by our security forces in combating the hybrid threat in J&K require no further emphasis. To deal with this challenge in an exhaustive manner, a novel attempt was made in 1993 by constituting a 'Unified Command in Jammu and Kashmir'. The same structure, with minor modifications continues till date. It comprises the Indian Army, Central Armed Police Forces (CAPFs) and the State Police, along with senior bureaucrats of the state. The state chief minister is the chairman of the Unified Command with the General Officers Commanding (GOCs) of 15 and 16 Corps of the Indian Army as his security advisors. However, this structure has had its share of challenges in combating the hybrid threats in J&K in the last three decades. Hence, there is a need to look at the pitfalls in the present Unified Headquarters structure in J&K, which would enable us to correct these faults and evolve this structure to relevance in the present situation.

While there is still a debate within the strategic establishment on the efficacy of Theatre Commands, there would be a fair amount of consensus when it comes to formalising joint structures under the Headquarters

**Weapons and technology for special forces are scarce and expensive, and must be sourced continuously, but in small quantities, as technologies keep changing. Selection of an unconventional cyber force for such operations could be an inescapable necessity through the employment of ad hoc teams that are put together from the environment.**

Integrated Defence Staff (HQ IDS) to combat hybrid threats in an OOAC contingency. Since speed of reaction would be critical, a lean and all arms force which is specifically trained and exercised for hybrid warfare, would fit the bill in putting in place an effective and immediate response mechanism.

Command and control of response mechanisms to hybrid threats within the hinterland and periphery pose far greater challenges to the national security establishment. The key here is to look at prescriptive and preemptive structures, rather than reactive ones like the ones that exist today. Decentralised decision-making and quick transfer of operational responsibility among the local civilian leadership, CAPFs, police forces and Indian Army holds the key to an effective response to the prevailing kind of threats that switch between direct terrorism, insurgency and proxy war. The integration of air power into this structure is an area that merits greater attention in both its offensive and enabling capabilities. Offensive and coercive capability in this domain demands speed and surprise as key ingredients and this can be ensured only with adequate decentralisation to execute operations well within the OODA loop of the adversary. Such structures would necessarily have to be placed under the seniormost military commander commanding the military formations in the concerned area of operations. An addition to existing structures is the necessity for a dedicated hybrid warfare commander who would orchestrate the logistics, equipment training, intelligence requirements and tasking of the force. While special forces would be the main surface force element, the hybrid warfare commander would necessarily have to possess a sound understanding of both offensive and enabling air operations as he would have to requisition assets like the C-130 J Hercules aircraft or Chinook/Mi-17 helicopters as well as RPAs for ISR and strike aircraft, should the need arise. Should the situation involve the maritime domain, it would demand a much greater awareness of naval matters. Such cross-over domain awareness is in short supply in our present system and needs immediate attention. Cyber capability at the operational level is an element that has been neglected and needs immediate attention.

## WAY AHEAD

Doctrinal work in the areas of hybrid warfare within the national security structures and the armed forces is the crying need of the hour. Bernard Fall's famous maxim on counter-insurgency, "*if it works, it's obsolete*", holds good for the current flavour of hybrid warfare too. Hence, development of defensive and offensive strategies must be constant and ongoing. Equipping forces to counter hybrid threats poses great challenges to logistics as they differ in many ways from weapons and systems that are employed in conventional conflicts. Weapons and technology for special forces are scarce and expensive, and must be sourced continuously, but in small quantities, as technologies keep changing. Selection of an unconventional cyber force for such operations could be an inescapable necessity through the employment of ad hoc teams that are put together from the environment.

While intelligence coordination for such operations are being continuously refined, there is room for much improvement, particularly in the realm of inter-agency intelligence sharing through agencies like the existing Multi-Agency Coordination Centre (MAC). The effectiveness of Subsidiary MACs (SMACs) in various states and prospective trouble spots holds the key to last mile intelligence connectivity which is so important for dynamic targeting.

While lethal special forces operating in small multi-skilled teams with state-of-the-art equipment and weapons would be the vanguard of hybrid forces, light armoured forces would have to be trained for hybrid situations in semi-desert or flat terrain that affords cross-country mobility. It is also critical to integrate air and naval platforms at all levels to be able to switch between conventional and hybrid roles with ease. The flexibility

**Regardless of how the threat is labelled, strategists must decide how best to address the methods employed by their adversaries, whether state or non-state actors. More complex threats require a whole of government or comprehensive approach. Usually, the best strategies involve the coordination and direction of all the effective instruments of state power, no matter how the threat is defined.**

**Keeping the current realities in mind, it is time that a dedicated military structure is evolved which is specifically trained and equipped to combat hybrid threats in the shortest possible timeframe. There is need for urgent transformation because the limits are expanding while the terrorist tactics are diversifying.**

of existing aerial platforms and fast attack craft only needs to be matched with the correct training and leadership. Holistically speaking, the aim of the above structures would be to ensure availability of a highly-trained hybrid warfare force capable of undertaking conventional and sub-conventional operations with an inherent flexibility of switching from one form to the other in a seamless way.

#### **CONCLUDING THOUGHTS**

Hybrid warfare does not change the nature of war. Violence remains at the core of hybrid warfare as it does any other form of war, and its aim is the same as any other act of war. Although the term “hybrid” is currently the most popular, it is by no means the only one to describe these wars. The fact that many armed conflicts blur the lines between war and peace and involve the use of instruments that were not traditionally part of war-fighting further complicates the problem. It is undoubtedly a challenge for traditional security establishments to address the wide range of threats identified by analysts and scholars of hybrid warfare. Cast the definitional net too wide, and a term like hybrid warfare becomes too all-encompassing to be of any practical use to policy-makers. Define warfare too narrowly, and policy-makers may fail to appreciate the significance of many non-traditional techniques of warfare that are being employed by an adversary as a prelude or adjunct to the use of military force.<sup>14</sup>

Regardless of how the threat is labelled, strategists must decide how best to address the methods employed by their adversaries, whether state or non-state actors. More complex threats require a whole of government or comprehensive approach. Usually, the best strategies involve the coordination

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14. James K. Wither, *Connections: The Quarterly Journal* 15, no. 2, 2016, p.86.

and direction of all the effective instruments of state power, no matter how the threat is defined.<sup>15</sup> Hybrid war is not only hybrid in its capabilities and its effects, but in its theory and logic as well. Aspects of classical theorists such as Clausewitz, Sun Tzu and proponents of unrestricted warfare and fourth generation warfare can be used to describe hybrid war<sup>16</sup>, which shows that this is not new phenomenon.

Keeping the current realities in mind, it is time that a dedicated military structure is evolved which is specifically trained and equipped to combat hybrid threats in the shortest possible timeframe. There is need for urgent transformation because the limits are expanding while the terrorist tactics are diversifying. For example, in J&K, connections are being established among terrorist organisations, insurgent groups and international organised crime, “home grown” and “lone wolf” type terrorist acts are being financed by complex mechanisms, social networks are being increasingly used to target public sentiments as was evident in the Burhan Wani case (July 2016), fake currency is being pumped in across the border to destabilise the existing economic set-up and also to finance the stone pelters along with psychological terrorist operations which are being aimed at creating tensions between civilians and the military. In addition, all these activities are supported in logistical terms by the provision of launch pads, terrorist training camps and extreme high altitude clothing by the Pakistani military establishment. This is accompanied by cross-border firing using mortars and other heavy calibre weapons by the conventional Pakistani military forces on the LoC to facilitate terrorist infiltration across the border. Thus, an integrated application of conventional and sub-conventional capabilities by the state and non-state actors of an adversary demands an integrated response by conventional specially trained forces

**Given the patterns of the past decade in India, the hybrid threat is expected to continue its diversification and increase in scale, increased stone pelting and agitation dynamics being a case in point.**

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15. Ibid.

16. Daniel T. Lasica, *Strategic Implications of Hybrid War: A Theory of Victory* (Fort Leavenworth, Kansas, 2009), p. 11.

Given the patterns of the past decade in India, the hybrid threat is expected to continue its diversification and increase in scale, increased stone pelting and agitation dynamics being a case in point. After the evaluation of the pattern of action, it is evident that hybrid threats are likely to pursue important and vulnerable goals: military camps, public institutions like schools, urban infrastructure and communications networks. It is precisely in such a scenario that the proposed joint structure under HQ IDS will have a telling effect. By its inherent capability, a dedicated structure to combat such threats will be able to act decisively in the shortest possible timeframe, thereby depriving the potential adversary of any easy operating environment. In addition, the same force would be able to apply itself seamlessly in geographically dispersed sectors, thus, validating the universal applicability of this force, both within the country and in the case of OOAC, should the need arise.

# CYBER ASTUTENESS: AN ELUSIVE ENABLER OF MILITARY DOMINANCE

**ASHEESH SHRIVASTAVA**

Operations Orchard, Estonia, Stuxnet or Black Energy have demonstrated the power of cyber space to shift the theatre of war from conventional battlefields to the 'virtual' domain. Hence, traditional physical boundaries and preventive measures are no longer relevant.

Recent world events have demonstrated increased exploitation of cyber space as a force multiplier for conventional warfare. This new method of war requires relatively fewer but highly specialised resources to mount an offensive. The techniques of cyber attacks have also specialised over the years. While traditional weaponry retains its advantages in the conventional battlefield, a cyber attack can now inflict an equally serious dent on a country's centres of gravity and critical infrastructure without physical intrusion into the adversary's air space. Cyber attacks are cheaper, more effective and easier to launch than conventional weapons and it is easier to hide the identity of those who launch them. Statistics on threats of cyber attacks also echo a paradigm shift from the relatively innocuous emails-based threats of yesteryears to more malicious threats today. Concurrently, there is also a direct cause-effect relationship between the growth of Information and Communication Technology (ICT) devices and their vulnerability to illicit and malicious cyber attacks.

Attacks or crimes in cyber space are not limited by geographical boundaries. The scale of such crimes in the recent past has made governments

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take notice of the disruption these attacks cause. Moreover, the size of the economy or the military might of a nation does not necessarily reflect the nation's ability to fight a cyber attack or the *cyber security awareness* of its population. Simultaneously, cyber security is a dynamically evolving environment wherein policies, laws, organisations skill sets, mutual cooperation and technical interconnectivity of networks need to be continuously updated to ensure safety against cyber attacks. Therefore, a robust cyber ecosystem, encompassing all facets of cyber space, is required to be in place to reduce the threat to, and enhance confidence towards, increased use of ICTs. This is required to enable the rapid economic growth of a nation.

Nonetheless, in this dynamically evolving environment, only having a defensive cyber ecosystem is insufficient to guarantee safety. Therefore, on the one hand, cyber security policies have to be harmonised as well as enforced across the entire nation and, on the other, offensive capabilities also have to be articulated for added paybacks. *This article debates the advantages of offensive cyber capabilities as a force multiplier for collective defence.*

The commentary reasons for the creation of a cyber offensive force to operate in conjunction with the existing security apparatus. To justify this argument, this narrative maps the history of cyber attacks across the globe which had military annotations. From these examples, it is evident that nations use the services of non-state actors to leverage their own political or military agenda. Non-state actors are much more difficult to identify. Therefore, it is necessary to establish a robust defence ecosystem to prevent cyber attacks. The strength of the ecosystem is measured by its Global Cyber Security Index. The limitations of the measurement technique

are also discussed in the article. Thereafter, it debates how nations can strengthen their cyber ecosystem by civilian-military participation. The article recommends the adoption of a two-pronged strategy towards cyber security. Firstly, strengthening the defensive mechanism and thereafter, developing offensive capability.

#### **HISTORY OF KNOWN CYBER ATTACKS ON CRITICAL INFRASTRUCTURE**

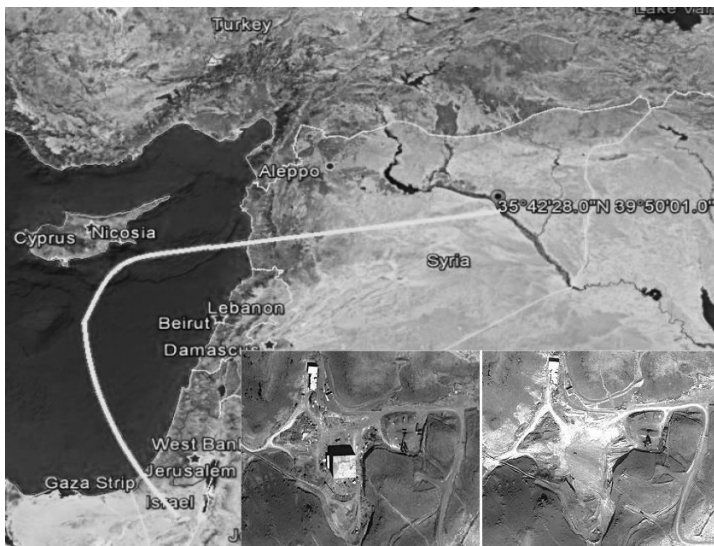
Recent history is replete with examples of cyber space being used to attack the critical infrastructures of adversaries, which were considered sensitive by the host nation. Cyber attacks have also been initiated by non-state actors with the candid support of state actors to alter the opinion of the populace; some examples are discussed in the following paragraphs.

**Syria, September 6, 2007:** The Israeli Air Force struck down a supposedly under construction nuclear reactor at Al Kibar in the Deirez-Zor region of Syria just after midnight (local time). This was called **Operation Orchard** which, according to news reports, was carried out by eight aircraft of the Israeli Air Force, including F-15s, F-16s, and Electronic Intelligence (ELINT) aircraft. The fighters were equipped with AGM-65 Maverick missiles, 500 lb bombs, and external fuel tanks. On the ground, the Israeli Air Force was assisted by a team of elite Israeli Shaldag/ Sayeret Matkal special forces commandos who painted the target with laser designators. A Google map depicting the location of the nuclear reactor and the supposed flight path of the Israeli Air Force aircraft is shown in Fig 1. The movement of the aircraft went unnoticed by the Syrian Air Defence (AD) network. It is believed that the Israeli Air Force's Electronic Warfare

**The Israelis somehow took over the computer system controlling the AD radar network, resulting in the radars continuously feeding false pictures of the air space on the display monitors and making the Syrian controllers believe that all was well. The Israeli aircraft flew almost 350 km into the Syrian air space, destroyed the targets and returned safely.**

(EW) system compromised the entire Syrian air defence radar system. In the event, the Israelis somehow took over the computer system controlling the Air Defence (AD) radar network, resulting in the radars continuously feeding false pictures of the air space on the display monitors and making the Syrian controllers believe that all was well. The Israeli aircraft flew almost 350 km into the Syrian air space, destroyed the targets and returned safely. The only clue of the Israeli Air Force's involvement in the mission was the sighting of an unmarked drop tank off the shores of Turkey. Later, US Air Force officials speculated that Israel used a technology similar to Suter to thwart the Syrian radars and sneak into their air space undetected during Operation Orchard. The Suter military computer programme was developed by BAE Systems for the US Air Force. It was designed to attack computer networks and communication systems of Russian origin. This event, for the first time, publicly demonstrated the offensive capabilities and reach of cyber technology as a military tool.

**Fig 1: The Flight Path of Israeli Air Force Aircraft and Photos of the Target before and after the Attack**



**Estonia, 2007:** Ethical hackers unleashed a wave of cyber attacks on Estonia, which is one of Europe's most wired countries. These Denial of Service (DoS) attacks that crippled dozens of government and corporate servers across the country are believed to have originated from Russia (refer Fig 2), a charge Moscow denies. The online assault started due to Estonia's decision to relocate a Soviet World War II memorial from downtown Tallinn, sparking off riots by the ethnic Russian minority. Experts confirmed the use of thousands of computers in a coordinated attack against government agencies and banks. A Google map screen shot showing the location of countries is placed in Fig 2.

**Fig 2: Moscow DoS Attacks on Estonia**



**Consequences:** The attacks had far-reaching consequences in Estonia and beyond, which:

- Prompted the North Atlantic Treaty Organisation (NATO) to enhance its cyber warfare capabilities and establish its cyber defence research centre at Tallinn.
- Motivated Estonia to call on the European Union to make cyber attacks a criminal offence.
- Provoked the Federal Bureau of Investigation (FBI) to position a computer crime expert in Estonia to help fight international threats against computer espionage.

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- Compelled NATO's Cooperative Cyber Defence Centre of Excellence to convene an international assembly of legal scholars and practitioners to draft a manual (Tallinn Manual<sup>1</sup>) to address issues on how to interpret international criminal laws in the context of cyber operations, cyber warfare and cyber offences.

**Iran, June 2010:** Iranian officials discovered that the computers of the control system unit at one of its nuclear (uranium) processing/enrichment plant had been infected by a computer worm called Stuxnet<sup>2</sup>. This worm

had a masterful and malicious piece of code that attacked in three phases. First, it targeted Microsoft Windows machines and networks, repeatedly replicating itself. It then hunted for Siemens Step7 software, which was also Windows-based and used to programme industrial control systems operating equipment such as the centrifuges of the nuclear plant. Lastly, it compromised the Programmable Logic Controllers (PLC). As a result, the worm disrupted the industrial systems and caused the centrifuges to spin uncontrollably and shut down the plant. The worm was specifically programmed to target the Supervisory Control and Data Acquisition (SCADA)<sup>3</sup> systems that were used to monitor and control centrifuges at Iran's nuclear enrichment plant at Natanz<sup>4</sup>.

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1. The Tallinn Manual 1.0 (originally Tallinn Manual on the International Law Applicable to Cyber Warfare) is an academic, non-binding study on how international law (in particular, the Jus ad Bellum and International Humanitarian Law) applies to cyber conflicts and cyber warfare.
  2. Kim Zetter, "An Unprecedented Look at Stuxnet, the World's First Digital Weapon", *The Wired*, March 11, 2014, <https://www.wired.com/2014/11/countdown-to-zero-day-stuxnet/>. Accessed on July 17, 2017
  3. SCADA (Supervisory Control and Data Acquisition) is a computer based industrial automation control system that practically makes factories and utilities run on their own. In an electrical system, SCADA maintains a balance between demand and supply in the grid and increasing its efficiency.
  4. David Kushner, "The Real Story of Stuxnet: How Malware was Detected", *IEEE Spectrum*, February 26, 2013, <http://spectrum.ieee.org/telecom/security/the-real-story-of-stuxnet>. Accessed on July 17, 2017

The Stuxnet worm was a watershed moment in the history of cyber security and some experts even consider it as the most sophisticated malware attack ever disclosed publicly. It is believed to have been covertly developed by the Israeli Intelligence Corps Unit 8200 with patronage from the US' Central Intelligence Agency (CIA)<sup>5</sup>.

**Ukraine, December 23, 2015:** Thirty power sub-stations distributing electricity to thousands of domestic consumers in central Ukraine were remotely disconnected from the national power grid. This attack on the power grid was codenamed Operation Black Energy<sup>6</sup> by the US authorities. Although the outage lasted for only about 2-8 hours, the hacking demonstrated the capabilities of cyber experts to remotely take over the SCADA systems. The adversaries entered the SCADA networks through hijacked Virtual Private Networks (VPNs) and sent commands to disable the Uninterrupted Power Supply (UPS) systems they had already reconfigured. Thereafter, they began to switch-off circuit breakers one by one, disconnecting the local sub-stations from the national power grid. Concurrently, they also launched a telephone denial-of-service attack against customer call centres to prevent customers from calling-in to report the outage. This gave the attackers more time to complete their mission and prevented the power distribution companies from becoming aware of the ground situation and the scale of the failure. This move illustrated a high level of sophistication and planning on the part of the attackers.

Ukraine has claimed with certainty that Russia was behind the attack, as relations between Russia and Ukraine had been strained ever since Russia annexed Crimea in 2014 and Crimean authorities began nationalising Ukrainian-owned power generation companies located within Crimea. Much before the December blackout in Ukraine, pro-Ukrainian activists had physically attacked a few sub-stations feeding power to Crimea, leaving about two million Crimean residents without power for over a day. Therefore, it

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5. Richard Behar, "Inside Israel's Secret Startup Machine", *Forbes Magazine*, May 11, 2016, <https://www.forbes.com/sites/richardbehar/2016/05/11/inside-israels-secret-startup-machine/#50b1b2691a51>. Accessed on July 17, 2017.

6. Kim Zetter, "Everything We Know About Ukraine's Power Plant Hack", *The Wired*, January 20, 2016, <https://www.wired.com/2016/01/everything-we-know-about-ukraines-power-plant-hack/>. Accessed on July 24, 2017.

was speculated that this blackout in Ukraine was a retaliatory cyber attack by the Russians to avenge the Crimean blackout.

These examples are just a few of the many cyber attacks launched every day by state and non-state actors against public/ private establishments. On many occasions, these assaults go undetected due to the lack of awareness of the users or losses not being attributed to cyber attacks. With time, the technology and complexity of the attacks are increasing progressively. This is making concealment easier and proving culpability almost impossible. Notwithstanding, the distinguishing characteristics of cyber attacks vis-à-vis conventional warfare have, by and large, remained unaltered over time.

### **CHARACTERISTICS OF A CYBER ATTACK**

A cyber attack is a cost-effective, asymmetric, deniable tool that can be deployed with little risk of reprisal, as detection/ culpability is very difficult to establish. The attacks can be easily customised to use the internet and communication infrastructure of a third-party nation or organisation. The examples of cyber attacks quoted in the preceding paragraphs bring out the following:

- Disproportionately large scale damage can be caused by relatively small investments in the technology infrastructure and manpower resource.
- No explosive weaponry is required to disrupt the social, financial, political or technical equilibrium of nations.
- Cyber warriors can be more dangerous than the best equipped armed forces with conventional armaments.
- It is very difficult to prove culpability as the identity of the perpetrator can be easily concealed.
- The attacks are a convergence of easily available tools, technologies and expertise, access to which is not limited by geographical boundaries.
- Tools and techniques are interoperable between state and non-state actors.
- *Cyber warriors are not bound by the ethical rules of conventional war which binds uniformed soldiers of law abiding and responsible nations.*

In spite of the clear and present danger, it is surprising that nearly half the world's countries have neither drafted nor adopted a national cyber security policy or strategy till date to counter this threat. This not only leaves the parent nation's critical infrastructure and economy prone to cyber attacks, but also offers a safe haven for criminals to mount attacks on other nations or organisations. A study by the United Nations to map the commitment of nations towards cyber security was carried out by the United Nations' International Telecommunication Union (ITU) in the year 2017.<sup>7</sup>

**From an Indian perspective, the survey only suggested that we have a fairly robust cyber ecosystem wherein laws, technical skills and organisational awareness are sufficiently developed to detect a cyber security breach. However, inter-agency partnerships and sectoral expertise, required to ensure a swift response, were found wanting.**

### CYBER SECURITY PREPAREDNESS QUOTIENT

The ITU's<sup>8</sup> sponsored survey measured the commitment of nations towards cyber security. The survey placed India<sup>9</sup> well above China in the Global Cybersecurity Index (GCI) 2017. Should this make Indians feel thrilled and content with the state of affairs in the cyber world? The answer to this question lies in the detailed analysis of the report and the parameters used for grading the countries. Some interesting facts are given below:

- The five key performance indicators used in the survey to rank the countries were: existence of legal apparatus, technical framework, organisational policy, Research and Development (R&D), investigation capacity and cooperation/ partnership model to enforce cyber security and foster economic development.

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7. UN ITU 2017, *Global Cyber Security Index (GCI) Report 2017*, [https://www.itu.int/dms\\_pub/itu-d/opb/str/D-STR-GCI.01-2017-R1-PDF-E.pdf](https://www.itu.int/dms_pub/itu-d/opb/str/D-STR-GCI.01-2017-R1-PDF-E.pdf). Accessed on July 24, 2017

8. Ibid.

9. Reuters, "UN Survey Ranks India at Number 25 in Global Cyber-Security Index", *NDTV News*, July 5, 2017, <http://gadgets.ndtv.com/internet/news/un-itu-global-cyber-security-index-survey-india-rank-1720990>. Accessed on July 24, 2017.



**It is a well-known fact that anti-virus and cyber security companies also have their own set of problems for not being able to quickly identify malwares. According to the NDTV Gadgets 360 magazine, only about two of the 60-odd anti-virus companies worldwide could detect the 'WannaCry' or 'Petya' malware in their first test iteration.**

- It highlighted the gaps in the cyber security ecosystems of countries in terms of their awareness, understanding, knowledge/ capacity to deploy proper strategies and their capabilities/ programmes to counter cyber attacks.
- Countries were ranked in terms of their legal, technical, organisational skills, capacity building and cooperation on cyber awareness.
- Singapore topped the list as the country most committed to cyber security, the US came second, whereas Russia was ranked 11th, India 25th, China 34th and North Korea 57th.

• The survey only compared the preventive approach of nations. However, in the new world order, an offensive posture in cyber is also a popular method of defence and deterrence, and a force multiplier.

Therefore, from an Indian perspective, the survey only suggested that we have a fairly robust cyber ecosystem wherein laws, technical skills and organisational awareness are sufficiently developed to detect a cyber security breach. However, inter-agency partnerships and sectoral expertise, required to ensure a swift response, were found wanting. This means that India's sectoral threat detection mechanism is world-class but the response mechanism is not quick and coordinated to ensure minimal losses. This also means that the existing multi-dimensional organisational hierarchy at the apex level prevents cohesion of talent. The survey brought out many new facets of the cyber ecosystem.

Therefore, before analysing the gaps in the Indian cyber ecosystem and the methods to overcome them, it would be in order to discuss the various advancements in the technology of cyber threats. These developments have made detection difficult and defence increasingly convoluted.

## CYBER THREATS: TECHNOLOGICAL ADVANCEMENTS

According to the Federation of Indian Chambers of Commerce and Industry's (FICCI's) Pinkerton India Risk Survey (IRS) 2017<sup>10</sup>, which was released on June 23, 2017, information and cyber insecurity would be the biggest business risks in the near future. During the interaction following the release function, Mr Alok Joshi, chairman, NTRO (National Technical Research Organisation) pointed out that both industry and government need to have a collaborative outlook to address the emerging threat of information and cyber insecurity. He further advised that "despite these known risks, users just aren't good at keeping their *Windows OS* based services patched with security software updates".<sup>11</sup> It is a well-known fact that anti-virus and cyber security companies also have their own set of problems for not being able to quickly identify malwares. According to the NDTV Gadgets 360 magazine, only about two of the 60-odd anti-virus companies worldwide could detect the 'WannaCry' or 'Petya' malware in their first test iteration.<sup>12</sup>

Technically, most cyber security (anti-virus) algorithms (software) identify malware by their genetic coding pattern. For example, the ransomware virus usually attempts to lock user files available in hard drives, by encrypting them. Based on this characteristic of ransomware, most anti-virus programmes flag those encryptions as surreptitious that don't show an 'on-screen' progress bar. A similar logic is used by anti-virus software to identify malicious programmes by matching their code/ behaviour against a database of known malware. Therefore, the database of malware codes at each computer terminal has to be regularly updated by the software. This is ensured by the anti-virus company by frequently asking its users to download the latest patch. Purely from the perspective of cyber security, this technique is only as good as the database of malware, which is based on the fingerprints of known viruses. However,

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10. Express News Service, "Cyber-Attack Top Threat to India Inc", *The New Indian Express*, June 24, 2017, <http://www.newindianexpress.com/nation/2017/jun/24/cyber-attack-top-threat-to-india-inc-1620215.html>. Accessed July 6, 2017.

11. Ibid.

12. Associated Press, "How Artificial Intelligence Is Taking on Ransomware", *Gadgets 360*, June 29, 2017, <http://gadgets.ndtv.com/internet/features/ransomware-petya-wannacry-ai-based-defence-1718339>. Accessed on July 28, 2017.

**Another problem facing the cyber security environment is the unrestricted proliferation of cyber espionage tools and technology into the hands of non-state actors/terrorist groups. Easy access to the internet has enabled these non-state actors to launch cyber attacks on behalf of their sponsors. These new groups are self-sustaining, technically qualified, highly trained and motivated.**

simple reasoning would explain that a new variant of malware can easily slip through the database by changing its identity just before the next update gets installed.

To control this, anti-virus companies are now employing machine learning algorithms which identify and block malware, ransomware, botnets and Trojans<sup>13</sup>. SentinelOne<sup>14</sup> even offers a \$1 million guarantee against ransomware. This demonstrates the growing confidence of anti-virus companies to new and better techniques. Clearly, this is a cat and mouse game between the hackers and anti-virus companies. Therefore, every ICT user needs to be aware of the cyber environment and make a determined effort to remain aware of the changing demography.

### **CYBER ESPIONAGE: ENABLER FOR DOMINANCE**

War is a state of armed conflict between nations or different groups within a nation. While all wars involve espionage, not all espionage is war. A number of countries across the world are engaged in espionage or spying against each other for defensive as well as offensive reasons. Cyber espionage is a highly tactical tool which can be used effectively for information gathering as well as information denial. In some scenarios, it can also act as a very offensive weapon which has power

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13. Trojan is a malware that disguises itself as legitimate software. It is employed by cyber-thieves and hackers to gain access to users' systems with an intention to spy and steal sensitive data. Trojans can delete, block, modify, copy data and/or disrupt the performance of computers or computer networks.

14. Sentinel One, "Protection Against Ransomware, Guarantee", <https://go.sentinelone.com/rs/327-MNM-087/images/SentinelOne%20Ransomware%20Warranty%20v3.pdf>, accessed on July 22, 2017.

to even topple governments<sup>15</sup> or threaten the sovereignty of nations. The methods of cyber espionage are continuously evolving. During its infancy, the approaches for cyber espionage were limited to defacement of government websites, denial of services, phishing of emails of government officials, spreading disinformation, etc. However, with time, the techniques of espionage have become more intelligent, advanced and sophisticated. New malwares can easily violate the privacy of classified data sources, suppress the functioning of electronic control systems, disrupt public services and proliferate misinformation within seconds. Trojans written specifically for espionage can remain undetected for a considerable period of time and thereafter be remotely activated (or programmed) to attack critical infrastructure on a pre-defined date and/ or time. High end technology to hack into computer networks and take over its functioning is easily available at minuscule cost.

Another problem facing the cyber security environment is the unrestricted proliferation of cyber espionage tools and technology into the hands of non-state actors/ terrorist groups. Easy access to the internet has enabled these non-state actors to launch cyber attacks on behalf of their sponsors. These new groups are self-sustaining, technically qualified, highly trained and motivated. They also specialise in exploiting the legal and technical frameworks of countries for their nefarious activities. These non-state actors are a greater threat, as it is difficult to identify them and/ or challenge their intentions. Some of these non-state groups also have the potential to cause large scale disruptions to the world order.

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15. The Panama Papers contained over 11.5 million leaked documents on personal financial information of more than 214,488 offshore entities, including politicians and corporate heads, leading to the resignation of heads of states of Iceland, UK, Brazil, Pakistan, etc.

The alarming reality is that some nations have started using the services of these non-state actors to further their own nationalistic or political agendas. History is witness to the fact that sophisticated network surveillance tools like GhostNet<sup>16</sup>, Red October<sup>17</sup> and The Mask<sup>18</sup> were developed at the behest of state governments by non-state actors to sabotage selected organisations or government networks. Another hacking tool called RCS (Remote Control System) was used by many governments,<sup>19</sup> including Azerbaijan, Colombia, Egypt, UAE, and Uzbekistan, to eavesdrop on the activities of other nations.

According to some media reports, countries have started engaging private agencies and individuals to extract classified information/data from social media sites, Internet Service Providers (ISPs), mobile companies, etc. The US government's National Security Agency's (NSA's) Prism programme was an example of how government agencies got involved in acquiring data from private entities. Similarly, nations like Israel, North Korea and Iran have also revealed their capability to take on technologically, economically and geographically mightier nations using the power of cyber space. It is alleged that North Korea has a clandestine connection with a hacking group called Lazarus. It is also believed that in the year 2016, the \$81 million cyber heist on the Bangladesh Central Bank and the 2014 attack on Sony's Hollywood studio were carried out by this group. The US government has since blamed North Korea for the Sony hack, and government prosecutors from Bangladesh are building a legal case against Pyongyang in the bank theft.

This exemplifies that technology is breaching the barrier between legitimate and illegitimate usage, as the tools and methodologies of cyber offence

16. John Markoff, "Vast Spy System Loots Computers in 103 Countries", *The New York Times*, March 28, 2009, <http://www.nytimes.com/2009/03/29/technology/29spy.html>. Accessed on July 25, 2017.
17. Dave Lee, "Red October' Cyber-Attack Found by Russian Researchers", *BBC News*, January 14, 2014, <http://www.bbc.com/news/technology-21013087>. Accessed on July 25, 2017.
18. Kim Zetter, "Sophisticated Spy Tool 'The Mask' Rages Undetected for 7 Years", *Wired*, October 2, 2014, <https://www.wired.com/2014/02/mask/>. Accessed on July 25, 2017.
19. Bill Marczak, Guarnieri, Morgan, and JS Railton, "Mapping Hacking Team's 'Untraceable' Spyware", *The Citizen Lab*, February 17, 2014, <https://citizenlab.ca/2014/02/mapping-hacking-teams-untraceable-spyware/>. Accessed on July 25, 2017.

are similar. Further, investigations into cyber attacks also highlight the connection among organised cyber criminals, terrorists and ransomware benefactors and dark currency (bitcoin) financiers. This nexus between state and non-state actors is a dangerous trend, for which the traditional deterrence tactics prove ineffective. Therefore, new strategies and plans to protect the national interest have evolved in which cyber space is gaining centre-stage.

#### **CYBER ASTUTENESS IN MILITARY DOMAIN**

Offence is the best way of defence in cyber space. An offensive cyber strategy not only strengthens the ecosystem, but also compels the adversary to reconcile its interventionist plans due to the fear of the unknown. Cyber astuteness can be defined as the ability of an organisation to quickly judge a situation and influence information and opinion by skilful use of cyber technology for commercial gains. It is a way to deploy defensive capabilities for offensive use. A few countries have mastered this skill and use it as a powerful strategy against adversaries by creating a narrative that influences public opinion. They have developed astute ways to use the internet as a weapon and target the social media, government information systems, infrastructures and utilities with the aim to cripple these socially or politically<sup>20</sup>.

Military experts believe that a large number of nations are in a state of virtual and undeclared war, either directly or through proxies, with each

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20. Russian cyber intruders tried to delete or alter voter data during the US election, Frank Vyan Walton, "Russian Cyber Hacks Breached Voting Systems in 39 States", Dailykos, June 13, 2017, <https://www.dailykos.com/stories/2017/6/13/1671421/-Russian-cyber-hacks-breached-voting-systems-in-39-states>. Accessed on July 24, 2017.

**A CNO disrupts the adversary's cyber space by denial, degradation or destruction of networked computers with an intention to affect the flow of information or data and degrade its decision-making ability. Most nations have camouflaged their cyber offensive formations by designating them as SIGINT, crypto analysis or military information units.**

other in cyber space. They are using soft skills to obtain critical big data and/ or disrupt/ corrupt/manipulate the same for commercial/ political/ military interests. This classified data is then exploited to gain access to critical infrastructures. For example, North Korean<sup>21</sup> hackers acquired confidential data, including, the personal details of workers, design manuals of nuclear reactors, electricity flow charts, etc of two nuclear power plants located close to Seoul operated by Korean Hydro and Nuclear Power (KHNP). This information was then shared on social media and a scenario

crafted around it as though the security of the nuclear power plant itself had been breached. This created panic amongst the locals, and an embarrassing situation for the South Korean government and the international nuclear safety monitoring agencies.

Full spectrum information superiority and dominance is crucial to influencing operations associated with war or Military Operations Other Than War (MOOTW). The conventional view is that information is power, therefore, more and more information is necessary to take measured decisions, whether in war or otherwise. In such a scenario, cyber warfare is a cost-effective, asymmetric, deniable tool that can be employed with little very little risk of reprisal. Presently, most information and data are digitised and transmitted over large networks of ICT devices. Computer Network Operations (CNOs)<sup>22</sup> are actions taken by militaries

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21. Justin McCurry, "South Korean Nuclear Operator Hacked amid Cyber Attack Fears", *The Guardian*, December 23, 2014, <https://www.theguardian.com/world/2014/dec/22/south-korea-nuclear-power-cyber-attack-hack>. Accessed on July 24, 2017.

22. Computer Network Operations (CNOs): use of cyber techniques by military establishments to infiltrate into hostile individual computers or networks to extract intelligence, sensitive or confidential data.

or intelligence organisations to leverage the potentials of the digital networks to gain information superiority and also prevent the enemy from using its own capability. CNOs also deal with protection of own ICT networks against unsolicited attacks and detection. A CNO has two main objectives:

- **Computer Network Attack (CNA):** This deals with utilising computer networks to design and perpetrate network attacks against targets or enemy computers and networks. It includes using computer networks to sneak / exploit / infiltrate into enemy or target networks or computers for the sake of extracting confidential information.
- **Computer Network Defence (CND):** This is used to respond to network attacks, exploitation and intrusions by the enemy or malicious users.

**According to the Western media, Israel's Unit 8200 is one of the most active, potentially lethal and cyber astute units in the world. Unit 8200 operates a massive spying network. It is one of the largest listening bases of the world, capable of monitoring phone calls, emails, and other communications throughout the Middle East, Europe, Asia, and Africa. It also tracks movement of aircraft and ships across the globe. It is believed to maintain covert listening posts in all Israeli Embassies abroad, and monitor feeds from undersea communication lines.**

A CNO disrupts the adversary's cyber space by denial, degradation or destruction of networked computers with an intention to affect the flow of information or data and degrade its decision-making ability. Most nations have camouflaged their cyber offensive formations by designating them as SIGINT (Signals Intelligence), crypto analysis or military information units. Further, such formations are never openly acknowledged by nations but speculative journalism and research data proves otherwise. Nations put forth different reasons for venturing into this domain. The



US created the NSA<sup>23</sup> (National Security Agency) under the Department of Defence to “collect, process and disseminate intelligence information from foreign electronic signals for national and foreign intelligence and counter-intelligence purposes, and to support military operations”. It also tasked the NSA to prevent foreign adversaries from gaining access to classified national security information. Similarly, other nations have also created dedicated military organisations to protect their cyber space, citing concerns about possible attacks on intellectual property. It is speculated that Russia, China, the UK, North Korea and Israel are amongst the top five nations that have been exploiting cyber technology for acquiring information/ data about allies and adversaries. This data is then used as a tool for negotiation and to forward their own economic, political and military plans. A list of some military formations/ units engaged in cyber offensive/ intelligence is given below:

**Table 1**

<b>Country</b>	<b>Name of Organisation</b>
USA	NSA
Russia	Federal Security Service (Federal'naya Sluzhba Bezopastnosti)
UK	MI6/Defence Cyber Operations Group
China	PLA Unit 61398
Israel	Unit 8200
N. Korea	Unit 810

The development and use of these military units which focus only on cyber warfare, is a cause for concern. However, in the succeeding paragraphs, we shall discuss only the strategies adopted by Israel and North Korea. As regards the top four countries, they are permanent members of the UN Security Council, with veto powers on all military affairs. They are also fairly large military and economic powers. Therefore, they blatantly and overtly engage in cyber astuteness by monitoring the

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23. NSA/CSS, “Frequently Asked Questions”, <https://www.nsa.gov/about/faqs/>. Accessed on July 26, 2017.

cyber activities of all countries and their citizens. They justify these acts as being oriented towards maintenance of world peace.

According to the Western media, Israel's Unit 8200 is one of the most active, potentially lethal and cyber astute units in the world. Unit 8200 operates a massive spying network. It is one of the largest listening bases of the world, capable of monitoring phone calls, emails, and other communications, throughout the Middle East, Europe, Asia, and Africa. It also tracks movement of aircraft and ships across the globe. It is believed to maintain covert listening posts in all Israeli Embassies abroad, and monitor feeds from undersea communication lines.

A majority of Israel's cyber spies of Unit 8200 are recruited under the *Magshimim programme*<sup>24</sup> which professes to nurture the talent of young students. School students as young as those in the 9th grade are enrolled for a three-year programme on computer coding and cyber security. During the course, they study programming languages and computing theory, implement cryptographic protocols, reverse-engineer malware, and design computer network architectures. This platform is aimed at incubating their talent and ideas for the cyber world and expanding the pool of soldiers to serve in the Israeli defence forces elite cyber unit. Students from this programme also join the high technology industries across the globe after completion of their compulsory military service.

**Kim Heung-kwang, a former computer science professor in North Korea who defected to South Korea in 2004, has said that most of Pyongyang's cyber attacks are planned by Unit 810 for raising money for its overseas intelligence wing, Reconnaissance General Bureau (RGB).**

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24. Christa Case Rryant, "Israel Accelerates Cyber Security Know-how as Early as 10th Grade", *The Christian Science Monitor-CSMonitor.com*, June 9, 2013, <http://in.bgu.ac.il/eng/ise/Documents/workIsrael-accelerates-cybersecurity-know-how-as-early-as-10th-grade.Printed%20version.pdf>. Accessed on July 22, 2017.

**Presently, the Prime Minister's Office (PMO) through the National Security Adviser (NSA) monitors the functioning of the National Technology Research Organisation (NTRO), National Information Board (NIB) and National Cyber Coordination Centre (NCCC). These three verticals form the umbrella set-up to coordinate intelligence gathering and sharing of issues/ advice amongst ministries and departments.**

On the other end, North Korea's Unit 810<sup>25</sup> is fast developing its cyber capabilities under the patronage of China. It has been recently blamed by officials and internet security experts for online attacks on the financial networks of various countries in order to finance its own overseas operations.

Kim Heung-kwang<sup>26</sup>, a former computer science professor in North Korea who defected to South Korea in 2004, has said that most of Pyongyang's cyber attacks are planned by Unit 810 for raising money for its overseas intelligence wing, the Reconnaissance General Bureau (RGB). James Lewis<sup>27</sup>, a North Korea expert at the Washington-based Centre for Strategic and International Studies, also opines that Pyongyang uses hacking as a tool for

espionage and political harassment of South Korean and US organisations. North Korea is also suspected of staging cyber attacks against the South Korean nuclear reactor in 2014, through Chinese or Malaysian IP addresses.

### **CONVERGENCE OF CYBER CAPABILITIES: NATIONAL RESPONSE**

Post the year 2014, traditional adversaries of the Cold War era realigned to form new alliances. These engagements were based on economic and

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25. Reuters, "North Korea's Unit 180, the Cyber Warfare Cell that Worries the West", *The Asian Age, Technology, e-paper*, May 21, 2017, <http://www.asianage.com/technology/in-other-news/210517/north-koreas-unit-180-the-cyber-warfare-cell-that-worries-the-west.html>. Accessed on July 6, 2017.
  26. Dave Lee and Nick Kwek, "North Korean Hackers 'Could Kill', Warns Key Defector", *BBC News*, May 29, 2015, <http://www.bbc.com/news/technology-32925495>. Accessed on July 24, 2017.
  27. James Andrew Lewis, *Report: North Korea's Cyber Operations* (New York: December 30, 2015) available online at <https://www.csis.org/analysis/north-korea%E2%80%99s-cyber-operations>. Accessed on July 25, 2017.

commercial considerations rather than geographical proximities. The realignments also led to doctrinal changes in the methods of aggression. Conventional techniques of physical engagement of militaries on the ground gave way to methods which are more precise and devastating. A comparison of the approaches of different nations towards building up cyber capabilities clearly indicates the importance that governments have assigned to this new dimension of war. Different methodologies are being adapted by nations to develop strong cyber capabilities and refine the doctrinal framework. Nevertheless, the directions of future wars are clearly inclined more towards exploitation of cyber space rather than the use of explosives alone. Given the strong IT soft-skills available within the country, it is time India converges its defensive and offensive cyber capabilities to achieve military dominance.

More than 700 websites of central ministries/ departments and state governments were hacked between the years 2013 and 2016 (199 in 2016, 164 in 2015, 155 in 2014 and 189 in 2013)<sup>28</sup>. This fact was revealed in a written reply to the Lok Sabha by Shri Hansraj Gangaram Ahir, minister of state in the Ministry of Home Affairs on February 7, 2017. The signature of these attacks suggested that most of them originated from servers or proxies stationed/ traced to Pakistan or China. It is also believed that Pakistani agents frequently use social engineering for espionage, opinion moulding and anti-national narratives, while the Chinese agents indulge at the more strategic levels and target military and economic centres.

Presently, the Prime Minister's Office (PMO) through the National Security Adviser (NSA) monitors the functioning of the National Technology Research Organisation (NTRO), National Information Board (NIB) and National Cyber Coordination Centre (NCCC). These three verticals form the umbrella set-up to coordinate intelligence gathering and sharing of issues/ advice amongst ministries and departments. As per details hosted on official websites of various ministries and departments of the Government of India, there are over 35 different agencies functioning under the Prime Minister's

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28. MHA, GoI, Reply to Lok Sabha unstarred question no. 806 to be answered on February 7, 2017, <http://mha1.nic.in/par2013/par2017-pdfs/ls-072217/806.pdf>. Accessed on July 24, 2017.

**Training is another important method to contain the devastation of a cyber attack. Sectorial training schools are required to be set-up across the country to give specialised training to operators and ground staff to handle all types of emergencies involving the functioning of their networked computer.**

Office, Ministry of Defence, Ministry of Electronic and Information Technology, Ministry of Home Affairs, Ministry of External Affairs (PMO, MoD, Meity, MHA, MEA) and various other ministries dealing with issues related to surveillance of cyber space, collection/ analysis of cyber intelligence and cyber security law enforcement. There are also sectorial Computer Emergency Response Teams (CERTs) with each ministry which have domain specialisation.

Having a large number of apex level agencies for management, coordination and supervision of cyber security has some advantages but also its own problems. Issues of overlapping and conflicting powers, functions, duties and responsibilities add up to ambiguity rather than synergy. Time is one of the most damaging components of a cyber attack. A delayed response can magnify the enormity of the damage. Therefore, cyber security should be treated as a collaborative function, and responded to with military precision.

Drawing inference from global inputs and the changing frontiers of warfare, the Joint Doctrine of the Indian Defence Forces was revised and released on April 25, 2017. The new doctrine emphasised on the development of a strong cyber agency and evolution of potent cyber warfare capabilities by India. The wherewithal for setting up of the new agency as well as the need to strengthen the existing IT security infrastructure was also finalised during the Unified Commanders' Conference, 2017. The conference was attended by Defence Minister Arun Jaitley, NSA Ajit Doval, the three Service chiefs and other senior military commanders. Concurrently, the Ministry of Defence also agreed to set up a new agency to bolster security infrastructure<sup>29</sup>. Accordingly, a Special

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29. PTI News service, "Def Minister to Set up New Agencies to Bolster Security Infra", *PTI News*, July 11, 2017, [http://ptinews.com/news/8878480\\_Def-Minister-to-set-up-new-agencies-to-bolster-security-infra](http://ptinews.com/news/8878480_Def-Minister-to-set-up-new-agencies-to-bolster-security-infra). Accessed on July 18, 2017.

Operations Division that includes the cyber and space agencies has been planned under the Headquarters Integrated Defence Staff (HQ IDS).

#### WAY FORWARD FOR CYBER DOMINANCE

It is also important to synchronise the military and cyber capabilities of the nation to maximise their effect, as in the case of Operation Orchid. It would be naive to assume that adversaries would not vector the cyber forces along with military force against us. Therefore, there is a need to develop an environment within the country to fight this threat as well as to develop offensive outreach. The writing on the wall is loud and clear. Cyber space benefits from asymmetry and future military campaigns would be planned in tandem with cyber operations. Therefore, technological superiority in the cyber infrastructure, with synchronised offensive capabilities, is required to position India as a cyber secure country, where economic developments are not threatened by cyber attacks.

India has a vast army of young software engineers. These budding professionals have positioned the country as the software development hub of the world. There is a need to initiate a programme like the Magshimim programme of Israel where young talent (school and college students) can be incubated and tasked to develop specific cyber skills. Also, the enrolment norms for the military services may also be tweaked to make way for professionals to be enrolled for cyber specific tasks.

Training is another important method to contain the devastation of a cyber attack. Sectoral training schools are required to be set-up across the country to give specialised training to operators and ground staff to handle all types of emergencies involving the functioning of their networked computers.

**It is important to continuously invest in technology, skill, training and knowledge. Further, given the anonymous characteristics of cyber space, an urgent reconciliation of capabilities, responsibilities and response mechanism of all the departments involved in security of cyber space is required.**

They also need to be trained to notice any malfunction or misbehaviour in the operator's console so that an alarm can be raised.

Hackathons are open competitions or events in which professional and amateur computer programmers, software developers, project managers and end users collaborate to develop new software technologies or find innovative solutions to real life problems. They also provide a platform to check the vulnerability and stability of the existing software's security architecture. The first of its kind Hackathon was conducted by the Government of India for 36 hours on April 1-2, 2017. More than 42,000 students and professionals participated across 26 locations in India to find solutions to 598 problems. The entire event gave a new dimension to how the present government is looking forward to use cyber space and how committed it is to ensure that the ecosystem remains conducive for growth. This is a positive approach and conduct of such events at regular intervals should be encouraged. It will go a long way in harnessing talent.

Lastly, there is always a requirement to demonstrate the offensive cyber skill of the nation. *Demonstration of capabilities is required to deter the adversary from enterprising a misadventure.* Like the military might of the nation is put on display during the Republic Day parades and in international military exercises, similarly, cyber offensive skills should be demonstrated publicly during occasions like Technology Day, etc.

## CONCLUSION

Cyber threats, today, have become more offensive and involve silent intrusion into the adversary's electronic networks. It is evident from the recent developments in cyber space that future military campaigns/ operations would be greatly assisted by ICT devices. As cyber space has the potential to deliver measured destruction, its smart use could change the course of operations. Therefore, countries are investing heavily into talent and technology for augmenting the capabilities of cyber space.

Concurrently, cyber criminals and hackers have no international boundaries. Therefore, it would be naive to imagine immunity from cyber aggression due to geographical distances or technical outreach. It is time that

all organisations, whether government run or privately owned, understand the pitfalls of an “unsecured” networked working environment. It is important to continuously invest in technology, skill, training and knowledge. Further, given the anonymous characteristics of cyber space, an urgent reconciliation of capabilities, responsibilities and response mechanisms of all the departments involved in the security of cyber space is required. Referring back to the ITU survey, it is time for India to strive to be included amongst the top 10 nations in the Global Cyber Security Index to match its aggressive development agenda. The policies and framework to counter cyber offences should be refined, along with a clear underlying intention and capability to go on to the offensive, if required. Only then can we claim to be a nation with a robust cyber security ecosystem.

Therefore, technological superiority in cyber infrastructure with synchronised offensive capabilities is required to position India as a cyber secure country, where economic developments are not threatened by cyber attacks.



# THINKING STRATEGICALLY

ASHISH SINGH

## INTRODUCTION

External observers repeatedly comment on the lack of strategic thinking in India's military. In his 1995 analysis of the Indian Air Force (IAF), George Tanham commented that Indians "do little formal strategic thinking" and "strategies just appear to evolve in India and much is done on an ad hoc basis."<sup>1</sup> Fifteen years later, a book by Cohen and Dasgupta restates the same problem in detail. They point out that the Services follow independent strategies to fight their independent wars, with the focus being on operational issues, not strategic ones.<sup>2</sup> While their arguments and conclusions may be controversial, we would do well to, if not introspect, then, at least, try to understand the perspective from which these authors write. This article explores the concept of strategy, and the ingredients which make up a good military strategist.<sup>3</sup>

To do so, it first explores the concept(s) of strategy. After seeing how multiple definitions of strategy are related to the context, the article expands on the *ends, ways, means* definition. It shows how strategy pervades all aspects

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1. George K. Tanham and Marcy Agmon, *Indian Air Force – Trends and Prospects* (Santa Monica CA: RAND, 1995), p. 7.
2. Stephen P. Cohen and Sunil Dasgupta, *Arming Without Aiming: India's Military Modernization* (Washington: Brookings Institution Press, 2010), pp. 150-152, at <http://www.gatewayhouse.in/sites/default/files/Arming%20without%20Aiming%20-%20Ch7%20Fighting%20Change.pdf>. Accessed on October 13, 2012.
3. However, the article has an air force bias, written for the air force.

**The strategist must develop the ability to use multiple lenses to view the world developing his unique understanding of the matter in question, first questioning his own biases, rather than jumping to conclusions. Last, he should be able to recombine his analysis into creative solutions. Implementing solutions is the job of the planner.**

of life, but as the level of problem solving increases, it grows complex and open ended.

Next, it shows how all strategy springs from the mind, and so good strategists need to develop ways of thinking. Thus, any attempt to evolve strategists needs to concentrate on developing the mind. The mind uses analogies and makes its personal theories called *schemas* to solve problems. Mental development relies on enriching the mind with experience and education to form schemas. Education needs to include multi-disciplinary theory and the evidence base of history. The strategist also needs to practise something called slow thinking. He

must develop the ability to use multiple lenses to view the world developing his unique understanding of the matter in question, first questioning his own biases, rather than jumping to conclusions. Last, he should be able to recombine his analysis into creative solutions. Implementing solutions is the job of the planner.

## ON STRATEGY

Strategy means different things to different people. They are all correct – in the context. Clausewitz had said, “It is the use of an engagement for the purpose of war”<sup>4</sup>. He was referring to military strategy in the context of its relation to political guidance. According to Jomini, “Strategy is the art of making war upon the map”<sup>5</sup>. He limited himself to movement of forces, being most concerned about prescriptive writing which armies could use. Moltke observed “Strategy is a system of expedients...the transfer of knowledge to practical life...in accordance with constantly changing

4. Carl Von Clausewitz, *On War*, edited and translated by Michael Howard and Peter Paret, (Princeton: Princeton University Press, 1989), p. 177.
5. Antoine-Henri Baron de Jomini, *The Art of War*, translated by Capt GH Mendell and Lt W P Craighill, (New York: Dover Publications Inc, 2007), p. 62.

circumstances"<sup>6</sup>. His context was about exploiting battlefield opportunities. Corbett understood it as "principles which govern a war", and also as "the art of directing force to the ends in view"<sup>7</sup>. He was talking about sea power and its relation to military power. Therefore, a theorist's sayings must be taken in the context in which he wrote. The one definition that I prefer is the most generalised and inclusive one: "It is the *ways* of achieving *ends* within available *means*".<sup>8</sup> The article will explain 'strategy' using this particular lens.

Strategy is all pervading, existing vertically at many levels, and horizontally in many disciplines. Thus, horizontally, we have not only military strategy, but business strategy and political strategy, to name a few fields. Military strategy, the primary context of this article, operates between strategy at levels both above and below. In the military context, today we understand that there is a hierarchical vertical gradation; grand strategy from which flows military strategy, Service specific strategy, operational art and, finally, tactics. Sometimes, the strategists have clearly demarcated these levels. For example, Corbett differentiated between major (today's military strategy), and minor strategy (Service specific operational plan), while Boyd referred to grand strategy and strategy<sup>9</sup>. At other times, it is left to the reader to understand what level of strategy is being referred to e.g. Jomini tackling the operational level in today's parlance. The point is that strategy is applied at every level, down to tactics. Thus, even the common foot soldier uses strategy when he applies

**The point is that strategy is applied at every level down to tactics. Thus, even the common foot soldier uses strategy when he applies tactics. He evaluates the threat, his own resources and then takes action towards the goal of preserving himself and neutralising the enemy.**

6. Daniel J Hughes, eds, *Moltke on the Art of War : Selected Writings* (New York : Ballantine Books, 1993), p. 47.
7. Julian S Corbett, *Some Principles of Maritime Strategy* (Annapolis: Naval Institute Press , 1988), pp. 15, 308.
8. Harry R. Yarger, *Strategy and the National Security Professional* (Westport, CT: Praeger Security International, 2008), p. 17. He cites Gregory D Foster, " A Conceptual Foundation for a Theory of Strategy," *The Washington Quarterly* (Winter 1990), pp. 47-48.
9. Frans P.B. Osinga, *Strategy and History*, vol. 18, *Science, Strategy and War:The Strategic Theory of John Boyd* (London: Routledge, 2007), p. 180.

**What then is the difference between these levels of strategy application? The difference is in two essential things: context, and flowing from that context, the scope of the strategy's three variables – ends, means, and ways. At the lowest levels, everything is limited in scope.**

tactics. He evaluates the threat, his own resources and then takes action towards the goal of preserving himself and neutralising the enemy. The national level strategist does the same – evaluate the environment, fix the goal, assess the means and figure out how to reach them. Ends, means and ways are applicable at every level.

What then is the difference between these levels of strategy application? The difference is in two essential things: context, and flowing from that context, the scope of the strategy's three variables – ends, means, and ways. At the lowest levels, everything

is limited in scope. At the lowest level of tactics, the ends are very limited, the means are fixed, so the ways are also few. Take the case of a fighter pilot flying an escort mission in war, who spots an adversary fighter aircraft. His limited *ends* are singular – ensure the strike does its job. The *means* at his disposal are his own formation, weapons, and relative energy state. His limited options (the *ways*) are to turn into the enemy to offer a fight, or turn away and escape. The choice he makes is dictated by the context of the stage of the mission and the relative advantage between the adversaries. Because means are fixed, and ends and ways limited, it is possible to reduce the strategy options into tactical Standard Operating Procedures (SOPs) and tactics manuals which pilots can learn by rote and self-actualise by practice.

The assertion that tactics is also small scale strategy may seem heretical. But, John Boyd's Observe, Orient, Decide, Act (OODA) loop theory has its roots in just such a tactical experience. Boyd's success in tactical combat as a fighter pilot led him to recognise the importance of the mind (and the right designed machine) in achieving "faster transients" at every level of war – from the cockpit, to creating "learning organisations," which would continue to always fight with advantage. The US Marine Corps was heavily influenced by Boyd's thought, enough to incorporate its essence in their

organisational structure and doctrine. Boyd was successfully able to apply metaphorical reasoning from the reductionist experience of the cockpit and combine it with insights from other branches of science to help create an artifact, the lightweight fighter (F-16). But the achievement he is more known for is his ability to extrapolate the same tactical concept to found his OODA loop theory.<sup>10</sup> He used tactical learning to develop higher level strategic theory.

As the level at which strategy is practised rises, all three variables expand in scope. The prime minister or president of a country has a canvas which is vast. Take the *ends*. Should he choose economic growth, or food security, or space exploration, or security first.<sup>11</sup> In which mix should he place priorities? Even after the *ends* are reduced to simpler forms (eg. territorial security), the *means* available are varied. They include diplomatic, military, and economic forms of strength. Should the nation get into an alliance to save on military expenditure, or buy the best equipment, or rely on tactical nuclear weapons to deter aggression cheaply, or go for large standing army? The final *ways* chosen would be a mix of many things, including creating future *means* (force structure). So, for example, Pakistan's '1000 cuts' strategy is being tackled using many *ways*: surgical strikes to send a message, relooking at the water sharing treaty to use leverage, a diplomatic offensive to achieve ostracisation, and demonetisation to squeeze terrorist funding. And unlike tactics, where the matter ends quickly, at the highest levels, the process is continuous, with priorities shifting as the context changes. All other forms of practising strategy fall somewhere between these two extreme examples; in terms of context, ends, ways, and means. At the higher levels of strategy, one of the better fitting definitions is Dolman's: strategy is about striving for "continuing advantage," rather than win in one situation.<sup>12</sup> At this level, strategists try more to shape the rules of the game rather than win any specific game.

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10. Robert Coram, *Boyd: The Fighter Pilot Who Changed the Art of War* (New York: Little, Brown and Company, 2002).

11. The guns, butter, or bread, problem.

12. Everett Carl Dolman, *Pure Strategy: Power and Principle in the Space and Information Age* (New York: Frank Cass, 2005), p. 6.

**Two conditions find organisation structure and culture unfit to deal with them. The first condition is when environmental evolution leaves the military outdated, but its culture and rules do not allow it to change. The second condition is that of war, a condition which is full of uncertainty, incomplete information, and an unpredictable adversary.**

As the level of the context rises, not just scope, but the complexity of the problem(s) at hand increases. Different people have expressed this phenomenon of increased complexity in different ways. Rittel and Webber called such problems “wicked problems.”<sup>13</sup> Others refer to them as “ill-structured problems.” People with a systems view of the world see them as part of a “complex system,” and often as part of a “complex adaptive system.”<sup>14</sup> Understanding such problems, let alone attempting to solve them, requires a different mental skill.

Militaries have a peculiar dichotomy between simple and complex problems. Long periods of peace require standard outputs and the ability to solve the same simple problems repeatedly. This is one reason why militaries are organised mechanistically, with fixed outputs. But two conditions find the organisation structure and culture unfit to deal with them. The first condition is when environmental evolution leaves the military outdated, but its culture and rules do not allow it to change. The second condition is that of war, a condition which is full of uncertainty, incomplete information, and an unpredictable adversary. The mechanisation of output and thought proves unsuited to deal with complexity. In both these conditions, “those in command of the organisation thus frequently find themselves facing issues which are inappropriately defined, and which they have no real idea of how to approach.”<sup>15</sup> People used to simplicity are left perplexed when faced with complexity.

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13. Horst W. J. Rittel and Melvin M. Webber, “Dilemmas in a General Theory of Planning,” *Policy Science* 4, 1973, pp. 155-169.

14. Stephen E Wright, “Two Sides of a Coin”, in Richard J Bailey et al., eds, *Strategy: Context and Adaptation from Archidamus to Airpower* (Annapolis: Naval Institute Press, 2016), p 235.

15. Gareth Morgan, *Images of Organization* (Thousand Oaks CA: Sage publications, 2006), p. 29.

**MAKING THE SCHEMAS OF STRATEGY:  
EXPERIENCE AND EDUCATION**

All strategy springs from the mind. The seeds of strategic thinking are sown from the time a human being is born. A child uses strategy to get what he wants, he cries, throws tantrums, smiles winningly, figures out what works, and employs that stratagem in the future. This method of learning strategy is from life itself—experience. He later applies lessons learnt in one sphere of life to others, through *schemas* and *analogies*. The term “*historical analogy*” signifies an inference that if two or more events separated in time agree in one respect, then they may also agree in another....A *schema* is

a generic concept stored in the memory...a person’s subjective theory about how the world works .. derived from generalizing across one’s experiences. An analogy is specific and concrete while a schema is abstract and generic.”<sup>16</sup> They are both mental models to simplify thinking towards improving judgment.

There are well documented cases of statesmen and generals using historical analogies to make policy decisions. These studies also show that the use of historical analogies was wrong, more often than not. American President Truman thought that North Korea’s invasion of South Korea was analogous to the German, Japanese and Italian expansionist policies which led to World War II. He further reasoned that not fighting back would be akin to Hitler’s appeasement at Munich. And so he went to war halfway across the world, in a fight in which his country had no real stake.<sup>17</sup> The problem with historical analogies is not that they are useless, it is that the practitioners have often used them wrongly, not trying to consciously analyse which parts of the analogy fit, and where the two situations are not identical.

**The brain uses self-formed theory more than we realise. It also rejects or downplays information which does not fit well with the schema/theory it is using. In such a case, availability of more varied schemas, and a conscious awareness or utilisation of theory helps judgment calls – better strategy making.**

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16. Yuen Foong Khong, *Analogies at War: Korea, Munich, Dien Bien Phu, and the Vietnam Decisions of 1965* (Princeton, N.J.: Princeton University Press, 1992), pp. 11,27.

17. *Ibid.*, p. 4.

Schemas are even more problematic. Analogies imply events in the same field of study. But schemas are *personal theories*, and once formed, will be applied unconsciously by the brain in all judgment decisions. They also tend to work “top-down”, which means that the brain squeezes the new information it is looking at, through the filter of pre-formed schemas. The brain uses self-formed theory more than we realise. It also rejects or downplays information which does not fit well with the schema/theory it is using.<sup>18</sup> In such a case, availability of more varied schemas, and a conscious awareness or utilisation of theory helps judgment calls – better strategy making. So, while the brain will use analogies and schemas, their use needs an education in both forming schemas, and learning how to use them.

And so, apart from experience, the other method of learning is by education. But, how much of a strategist’s acumen is owed to life experience, and what proportion to formal education?

Genius needs little education. This assertion has been supported by many theorists starting from Clausewitz. Clausewitz has devoted an entire chapter on military genius<sup>19</sup>. At various places in his writing, he emphasises that true genius has no need of anything else to succeed<sup>20</sup>. Fuller calls genius the greatest master of the art of war and puts Alexander, Hannibal, Gustavus and Napoleon in this category<sup>21</sup>. The one conqueror who shows how genius needs little is Ghengis Khan, who grew up in the steppes of Mongolia, as an outcast, learning his lessons from the elements and the harshness of the elements. And contrary to popular opinion, his achievements were not just in warfare, he successfully reorganised his army, introduced meritocracy, understood the importance of terror as a tool of propaganda, and also put into practice policies to promote a free trade economy.<sup>22</sup> He learnt from life alone. This is the most common way of personal ‘theory making’ – extrapolating from the specific experiences to form the general schemas.

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18. Khong, n. 16, pp. 37-39.

19. Clausewitz, n. 4, pp. 100-112.

20. *Ibid.*, p. 136.

21. Col JFC Fuller, *The Foundations of the Science of War* (1926 repr. Fort Leaveworth: US Army CGSC Pres, 1993), p. 98

22. Jack Weatherford, *Ghengis Khan and the Making of the Modern World* (New York: Broadway Books, 2004).



But unlike Ghengis Khan, most people's life experience is not enough; they need education. Even Clausewitz, who respects genius, says, "No activity of the human mind is possible without a certain stock of ideas."<sup>23</sup> Education provides these ideas from which *schemas* can be formed. The more varied the learning, the more the *schemas* available. Apart from his education in war as the son of a king, Alexander was educated about the world by Aristotle. Napoleon was influenced by theorists like Saxe, Bourcet, Guibert and Du Teil.<sup>24</sup> All three conquerors also learnt about war from the successive battles they fought. But the person education most benefits is the common man. Most of us are common men and women. So far, we have seen how these mental models or schemas need a combination of experience, and education But, for a peculiar reason, the military man needs education even more than others.

For military strategists, wars are the best teachers. But for most countries, wars are few and far between. So most military organisations anticipate by hypothesis. Unlike other government bureaucracies," instead of being routinely 'in business' and learning from ongoing experience, they (militaries) must anticipate wars that may or may not occur."<sup>25</sup> So, in the absence of real life experience, the military mind needs education even more than a practitioner in any other field. This deduction further begs the question: what kind of education does the military thinkers' mind need, and what happens if this education is lacking?

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23. Clausewitz, n. 4, p. 14.

24. Osinga, n. 9, p. 144.

25. Stephen Peter Rosen, *Winning the Next War: Innovation and the Modern Military* (Ithaca, NY: Cornell University Press, 1991), p. 8.

## THE EDUCATIONAL TOOLS OF A STRATEGIST: THEORY AND HISTORY

For the military strategist, education required to form varied schemas needs both the evidence base of history, as well as theory. Military theory differs slightly from theory as understood in the physical sciences. The Webster's definition of theory is "a coherent group of general propositions used as principles of explanation for a class of phenomena"<sup>26</sup>. Military theory has been defined as "the aggregate of theories, doctrines, and beliefs belonging to a particular individual, community or period. It refers to the concepts, hypotheses, or principles developed by soldiers and civilians to solve military problems"<sup>27</sup>. Thus, while using the term military theory, a person may refer to any or all of these terms. These theories are generalisations of observed phenomena, deductive inferences, and often a combination of both.

Military theory is not as exact as theory in the physical sciences. It cannot be proven by experiments. It is not always true. But this inexactness is tolerated because people understand that the complexities involved are too many to be reduced to simple equations. Its inexactness has been largely attributed to the human psychological factor<sup>28</sup>. Some examples of military theory include the writings of Sun Tzu and Clausewitz, parts of Kautilya, or even John Boyd or John Warden. Campaigns have been planned around some of their generalisations. So, despite all its inexactness, military theory is an essential tool for the budding strategist.

Theory does at least five things for the military professional. It defines the field under study, categorises it, explains, connects it to other related fields of study, and, finally, anticipates the future.<sup>29</sup> This article itself is an example of the use of theory. In the context of understanding strategy for the military professional, it has attempted all five things. First, it has tried to define what many people understand as strategy. Next, it has categorised,

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26. Harold R Winton, "An Imperfect Jewel: Military Theory and the Military Profession," *Journal of Strategic Studies*, vol 34, issue 6, 2011, p. 2.

27. Osinga, n. 9, pp. 8-9.

28. Clausewitz, n. 4, pp. 136-137.

29. Winton, n. 26.

or divided this study into its constituent parts as per my perception – the depth and breadth of the subject. Third, it has expanded on each portion of this division to explain my conception of the subject. Fourth, it has connected military strategy with other fields of study: psychology, judgment, education, history and career path of military men, to name a few. Last, the entire article endeavours to help the reader figure out his way of how to use the insights presented here in order to conceptualise for the future. One of the subjects it attempts to anticipate is a template or method of educating better military thinkers.

**Most people want to use this theory to predict the future, but Clausewitz believed its biggest utility was for it to be used as a way through which to view and internalise the lessons of history. A reading of military history by itself can do little for the military professional.**

Most people want to use this theory to predict the future, but Clausewitz believed its biggest utility was for it to be used as a way through which to view and internalise the lessons of history. A reading of military history by itself can do little for the military professional. Data and facts by themselves are useless. “Only in the light of a theory....can they speak to us in revealing ways. Facts never speak for themselves....they are always spoken for.”<sup>30</sup> There is no true objectivity; every study needs a subjective lens. Multiple lenses allow the limitation of each particular lens to diminish. At higher levels of problem solving, good strategists need to be erudite in both facts and theory, and in multiple fields.

As an example, take related fields like National Security or Foreign Policy. These fields require its officers to strategise at the highest levels on problems which have no black and white solutions, and a mix of conflicting interests. And as the former National Security Adviser and Foreign Secretary Mr Shivshankar Menon explains, strategy boils down to making ‘choices’ with incomplete information. In contrast to the military man who does not practise his craft at the highest levels, and so is forced to hypothesise, the Foreign Service man is a daily practitioner of his craft. A reading of Mr

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30. Everett Carl Dolman, “Seeking Strategy”, in Bailey et al. eds., n. 14, p. 30.

Menon's book, *Choices*, shows his awareness of the theories and theorists in multiple fields from defence to nuclear strategy to international relations. With an MA in history, he emphasises the importance of historical study for the strategist in saying "the best a practitioner can do is be aware of, and open to, the possibilities and consequences of choices, something historians are trained to do by their discipline."<sup>31</sup> Apart from his innate ability, his practise has been empowered by both theory and history.

Unfortunately, militaries in general, and air forces in particular, neglect both history and theory the most.<sup>32</sup> There are three causes for this blind spot. First, aviation is the newest technological form of military power, barely a hundred years old compared to thousands of years of land and maritime power's history. The first air forces carved themselves out of navies and armies, and so were organisationally pushed to adopt doctrines which justified their separate existence. This led to a negation of the importance of the 'old' ways of war, in terms of both history and theories.

Second, having a short history itself, air power practitioners assume there is not much to learn from the history of aviation, and tend to concentrate on current conflicts and the future. This bias against aviation history unknowingly becomes a bias against all history. They do not realise that the 'current situation' is but a snapshot in the vector of history, a snapshot which moreover is tinged with the biases which each observer carries unconsciously. Nor do they realise the interconnectedness of the theories amongst fields other than aviation. Thus, they do not know that solutions to problems in their field of practice also exist in fields other than their own.

The third reason for air forces being a-historic is that a force which perceives its power as stemming from technological machines (more than its men and women), is always looking for technological solutions to every

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31. Shivshankar Menon, *Choices: Inside the Making of India's Foreign Policy* (Digital Edition :Penguin Books, 2016), Loc 2306. While he specifically mentions that he is a practitioner and not a theorist, his awareness of the theorists is visible in the bibliography and even the arguments he puts forth.

32. Take any higher command level course or even the National Defence College syllabus and analyse it for theoretical and historical content. One historian has done this analysis chronologically for the USAF, and shown how historical study has been a late entrant. Richard R Muller, "The Airpower Historian and the Education of Strategists", in Bailey et al., eds., n. 14, pp. 113-123.

problem.<sup>33</sup> So it is not surprising to find most air force course syllabi having large amounts of time devoted to the latest technology, current capability, latest wars, global developments – but little history. Technology is about building new systems and machines in the future to solve current problems. The past seems to have little relation to technology.

As per one historian, history can do at least four things for air power practitioners and thinkers. First, its study can “instill corporate spirit and foster awareness of air power’s rich heritage.”<sup>34</sup> Thus, a study of our wars of 1947, 1962, 1965, 1971, and 1999 tells the story of the

evolution and contribution of our predecessors. The heroic feats of stalwarts like Baba Mehr Singh in saving Kashmir in conditions so much worse than those in which we currently operate, can instill a sense of awe and pride in the rookie pilot. Next, history can explain the origins and logic behind the “current doctrine, operational concepts, organizational reforms, or weapon systems.”<sup>35</sup> For example, the role of the rocket attack on the governor’s house at Dacca in bringing about the surrender brings home the lesson about air power’s coercive effect, without having to defeat fielded forces. Third, “it can improve current practice by establishing a common vocabulary, providing a basis for analogical reasoning, or identifying broad patterns of development.”<sup>36</sup> So, a study of related fields like say the evolution of the Marut aircraft can inform the practitioner who is curious about technological

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33. For example, air forces measure casualties in terms of aircraft shot, own or the enemy’s, as a measure of performance. Armies, instead, count casualties in terms of lives lost. The least count of combat power is an aircraft for air forces and an individual for armies.

34. Muller, n. 32, p. 123.

35. Ibid., p 124.

36. Ibid., p. 125. Most of the current military usage is encompassed by this reason – a quest for ‘lessons learned’ and ‘takeaways.’

evolution, of likely pitfalls and solutions in developing the Light Combat Aircraft (LCA). Most importantly, it instills “habits of the mind,” and fosters “patterns of inquiry,” in military professionals.<sup>37</sup> While the first three reasons help all practitioners, this last reason is the most compelling in the making of thinkers, and this is something Mr Shivshankar Menon too has emphasised.<sup>38</sup> It addresses the issue of learning ‘how to think’ rather than ‘what to think,’ especially in using lessons of the past to either solve current problems or peer into the future.

Also, the emphasis on ‘hard sciences’ means that right from intake to retirement, militaries produce a certain kind of thinker – the linear thinker. For most air forces, the officer corps and especially the ‘war fighters’ “are mostly male, with educational backgrounds in STEM – Science, Technology, Engineering, and Mathematics.”<sup>39</sup> These types are “linear thinkers,” because “most of what the military does is linear *tasking*,” ..... “things done in an orderly manner, moving from step one to step ‘last’ in an efficient and effective manner.”<sup>40</sup> They perform well till the stage where tasks require linear thinking – tactics in war-fighting, and planning in peace-time. Thus, these are great planners, who can plan well a defined job; for jobs ranging from yearly training planning, to flying exercises, to fly-pasts and managing many such events. This type of personality, “STEM-oriented linear thinkers with strong personality tendencies towards accomplishment rather than reflection,” is also just what we need in large numbers for addressing a majority of day-to-day problems and tasks. The problem occurs when we are faced with complex issues in an uncertain environment, which need

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37. Ibid., p.125.

38. Menon, n. 31, Loc 2306.

39. Wright, n. 14, p. 234. For the IAF pilot, intake mandates physics and mathematics in class XII. Professional courses which have to do with Instruction (QFIC) or Tactics (TACDE) continue to emphasise these subjects. The next educational degree at Staff College is tellingly an MSc, not an MA. The air force, in particular, is biased towards the hard sciences over the arts. Hard sciences translate to linear equations with a high degree of certainty biased towards statistical methods and minimum ambiguity. Arts, on the other hand, thrive in the domain of subjectivity and uncertainty.

40. Ibid., p. 234. The STEM emphasis also leads to the belief that theories only exist in hard sciences, and, therefore, the emphasis of air forces, and now the Indian Navy for the science background student. Thinkers like Clausewitz are relegated to ‘could know’ knowledge, while hard sciences are ‘must know.’

strategists to understand and frame guidance which planners can then execute. Peace-time policy formulation and war-time strategy are two such problems. These problems require abstract thinking.

This relation between strategists and planners explains why at the operational art level, Command Air Operations Centres (CAOCs) of the Western air forces have an organisational structure which includes a separate strategy cell / division, for guidance, which another cell executes by developing an Air Tasking Order (ATO).<sup>41</sup> While both cells need continuous interaction, the strategy creation mechanism has been deliberately separated from the planner's mechanism. Both need differing mental skills.<sup>42</sup>

In times of prolonged peace, the organisations may not even realise that they are grooming no strategists and all planners. This is because you can't fail in peace. And even if you fail in war, linear thinking will quickly attribute cause to effect, and address, more often than not, the symptoms rather than the malaise. So, for example, flowing from the Kargil Review Committee's analysis, the headquarters of the Services were renamed, rather than reorganised. All three Services also ended up building more technological capability, but not much else.

Strategic thinking at higher levels of complexity requires *slow* rather than *fast* thinking, but fast thinking is the default mode for most of us. Daniel Kahneman coined these two terms. He explains how fast thinking (or what he calls System I) is a necessary inbuilt evolutionary mechanism, by which we unconsciously absorb environmental inputs and always have an answer to most problems with minimal inputs. This mode is always working unconsciously, "shaped by evolution to provide a continuous assessment of the main problems that an organism must solve to survive."<sup>43</sup> So, for example, if someone asked you about the likelihood of rain tomorrow, you are ready with an answer within seconds. A slow thinker would instead reach out

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41. For example, see Fig 2 of Wg Cdr Redvers TN Thompson "Post Cold War Development of United Kingdom Joint Air Command and Control Capability ," at <http://www.au.af.mil/au/afri/aspj/airchronicles/apj/apj04/win04/thompson.html>.

42. And yet, these boundaries between strategising and planning skills cannot be mutually exclusive. The strategist needs to understand planning limitations, while the planner needs the ability to visualise conceptual guidance.

43. Daniel Kahneman, *Thinking , Fast and Slow* (Digital Edition: Penguin, 2011), Loc 1543.

**When a senior pilot with lots of tactical experience is suddenly faced with operational or strategic level problems, it is natural to default to schemas formed by his life experience. This situation is especially challenging if he is asked to work in the absence of rules, procedures and SOPs, which are what the planner uses as starting points before he can do any work. The strategist, on the other hand, helps frame these boundaries, frameworks, and establishes *what is to be done*, and frames guidelines about how it is to be done, after understanding the context.**

to a meteorologist, a website or statistical data before venturing to answer. Availability of multiple theoretical schemas allows the slow thinker many ways of developing an understanding of the problem.

In the evolutionary mechanism, a slow thinker would also perish fast. Our ancestors had to quickly make decisions about 'fight or flight,' based on minimal inputs, and fast decision-making. We continue to need this mode even today; for example, in the earlier situation of two fighter pilots meeting in the sky during war-time: a slow decision would mean death. Slow thinkers also tend to perish in organisations, for, metaphorically speaking, the urban jungle also

follows evolutionary laws. As per one commentator, while most abstract thinkers in the military perish "as a result of a thousand cuts," the few, who survive, hide.<sup>44</sup> This does not imply that the two modes of thinking are mutually exclusive. Just that slow and abstract thinking is rarer, and atrophies due to organisational pressures.

For all thinkers, the default mode of thinking, the System I / fast thinking mode, working on 'autopilot,' kicks in even when trying to solve complex problems at higher levels of decision-making. In the absence of theoretical and historical learning, when faced with new and complex problems, our planner's brain will use fast thinking to pull schemas informed by his life experience. He will use these schemas as filters with

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44. Wright, n. 14, p. 235.



which to view the situation. All his understanding of situations will flow from his not inconsiderable tactical experience, much of which is from inside the cockpit.<sup>45</sup>

Especially for military aviators, his life experience is unsuited to form varied schemas. The aviator's understanding of war-fighting is limited to tactics for almost 20 years of his experience. The centralisation of air war-fighting at the command level means that the majority of military aviators are never exposed to even hypothetical operation art for most of their careers. This is in contrast to armies, where war-gaming is routine, and all ranks of officers are routinely exposed to the complexities of operational art, at escalating levels of unit, brigade, division, corps and then command.<sup>46</sup> Thus, when a senior pilot with lots of tactical experience is suddenly faced with operational or strategic level problems, it is natural to default to schemas formed by his life experience. This situation is especially challenging if he is asked to work in the absence of rules, procedures and SOPs, which are what the planner uses as starting points before he can do any work. The strategist, on the other hand, helps frame these boundaries, frameworks, and establishes *what* is to be done, and frames guidelines about how it is to done, after understanding the context.<sup>47</sup>

Slow thinking is difficult, requires effort, and the human brain tends to avoid it. This is because the complexity of the problem requires effort to “simultaneously maintain in the memory several ideas that require separate actions, or that need to be combined according to a rule”<sup>48</sup> (or theory).

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45. Interestingly, an army officer posted as staff at the College of Air Warfare pointed out that air force officers (pilots) tend to view the world from inside the cockpit, and to understand it better, they needed to view it from outside. Conversation, February 2017, *after* this paragraph had been written. This is another way of expressing John Boyd's postulate that reality can never be correctly perceived from within a system.

46. Although repeated exposure to 'company policy' in a closed environment can also atrophy creative skills. Diversity of exposure is a prerequisite for good schema formation.

47. To see the differences between the strategist and the planner in greater detail, see Wright, n. 14, pp. 236-242. Also, to understand why air forces are so much more SOP dependent, as compared to armies, which are task-oriented, see Ashish Singh "Arms and the Game: Accepting Competition and Encouraging Cooperation," *Journal of Defence Studies*, vol. 10, no. 1 January-March 2016, pp. 17-42, at [http://www.idsa.in/jds/jds\\_10\\_1\\_2015\\_arms-and-the-game](http://www.idsa.in/jds/jds_10_1_2015_arms-and-the-game) .

48. Kahneman, n. 43, Loc 593.

In his path to the OODA loop theory, John Boyd explored these concepts in his essay, *Destruction and Creation*.<sup>49</sup> He explored how we make concepts either through deduction or induction; from the general to the specific or from the specific to the general. Using Heisenberg's uncertainty principle, the Laws of Entropy, and Godel's Incompleteness mathematical theorem, he showed how there will always be a mismatch between reality and our understanding of it. He also tried to show a way to tackle this problem through destructive deduction (taking concepts apart) and inductive creation (synthesising the separate threads in new combinations) to create new concepts / realities.<sup>50</sup> In a way, he was exploring creativity. This is part of a strategist's job. This skill is unlikely to develop without practice.

Thinking strategically requires a combination of critical and creative thinking. Critical thinking is "thinking that is purposeful, reasoned, and goal directed.....the deliberate, conscious, and appropriate application of reflective skepticism."<sup>51</sup> It includes analytical thinking. Analytical thinking requires the strategist to do Boyd's destruction: of taking things /ideas/ concepts apart, understanding the essence of an argument/ event/ or history itself. Creative thinking is the third and final part of this three-step process. Creative thinkers display the following characteristics<sup>52</sup>:

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49 John R Boyd, "Destruction and Creation," September 3, 1976, at <http://globalguerrillas.typepad.com/JohnBoyd/Destruction%20and%20Creation.pdf>. Accessed on December 21, 2016.

50. In his famous briefings, he gave an example of this process. He asked the audience to imagine a skier, motor boat, a toy tractor/tank with rubber treads and to take them apart mentally till they were left with only skis, an outboard motor, handlebars, and rubber treads. He now asked them to create something new. He next showed them how these components extracted in a destructive process could be combined via synthesis to create something new – a snowmobile. Osinga, n. 9, pp. 202-203. You can do this with anything – machines, organisations, or concepts – provided your mind is used to doing it.

51. Col Stephen J Gerras, "Thinking Critically about Critical Thinking" (US Army War College, 2008), p. 3, at [http://www.au.af.mil/au/awc/awcgate/army-usawc/crit\\_thkg\\_gerras.pdf](http://www.au.af.mil/au/awc/awcgate/army-usawc/crit_thkg_gerras.pdf).

52. Osinga, n. 9, p. 79.

Thinking Abilities	Personality Characteristics	Thinking Styles
Uses metaphors in thinking. Flexible decision-maker. Uses broad categories. Uses mental images. Can cope with novelty. Can break mental sets. Finds order in chaos.	Willing to take intellectual risk. Curiosity and inquisitiveness. Openness to new experiences. Tolerates ambiguity. Broad range of interests. Playful with ideas Intuitive.	Challenges assumptions. Looks for novelties and gaps in knowledge. Draws new ideas out of existing knowledge.

Our military is not to blame for the lack of emphasis on the strategic thinking skills. Instead, our educational system has a major role to play. This point can be easier understood by parents who have switched their children's education from a traditional Central Board of Secondary Education (CBSE) to an International Baccalaureate (IB). IB is fast gaining popularity in India. The traditional way of education, which most of us have gone through emphasises rote learning, information processing, and recall. The syllabus, condensed into books, forms the core content of education, and the student is tested from within the book. The IB, on the other hand, depends heavily on the enquiry method of learning concepts, emphasises creativity, and has no prescribed books. The advantage of the CBSE format is its relative lower dependence on the quality of the teacher, where the book content can help score in the standardised syllabus. The IB method, on the other hand, is very dependent on the teacher, and so can result in disaster in the hands of a bad teacher. Our military education system is only a continuation, and reflection, of the traditional education system in general.<sup>53</sup> Most military education also tends to conform to the CBSE style emphasis on précis or manuals or doctrine books, whose contents are to be learned by the student. And the same dynamics of teacher quality versus model of education hold well in the military. Educating military men to think strategically will require, above all, quality teachers. In the absence of quality teachers, we will have to fall back on quality books.

53. For this insight, I owe my wife who holds a Masters in education.

The strategists' education is not for everyone. This is because the military needs linear thinkers and with good fast thinking reflexes for most tasks. However, two classes of people cannot do without strategic thinking skills. The person who most needs this kind of education is the leader. The second class of people comprise his advisers. In military parlance, this translates to the general and his advisory staff. The general needs to be both a leader of war-fighting men, and a strategist in thought. He needs both fast thinking (System I) to fight the battle and slow thinking (System II) skills to strategise the uncertainty of war, as well as for organisational evolution. His advisory staff (as opposed to the planning staff), also needs strategic thinking skills. And this is the reason why the greatest military generals and statesmen had their IB style great teachers: Aristotle (Alexander), Dronacharya (Pandavas), or Chanakya (Chandragupt Maurya). The best generals mastered both forms of thinking as they were educated.

However, a particular kind of school or college education system still does not mass produce strategists. On the contrary, even in the Western militaries, the default soldier is still the planner. This is one reason why all militaries follow reductionist logics. All military organisations are prone to reducing everything, including complex concepts, to the two big 'Ps' – procedures or processes. Whether it is the Centre of Gravity (CoG), Effects-Based Operations (EBO), Appreciations, Military Decision-Making Process (MDMP), Political, Military, Economic, Social Infrastructure Information (PMESII), or Joint Operation Planning Process (JOPP), militaries routinely publish a SOP or process on everything: the 'how to' manuals. This is because they are catering for the linear thinking planner at the tactical level of war.

At the operational level of war, the relatively new concept of Operational (Op) Design has been developed to deal with the initial understanding of messy military problems. This concept ties together many theories – of critical and creative thinking, taxonomy of learning, systems theory, the nature of problems, and military constructs—to try and develop a mechanism for a shared understanding amongst the problem solving team of the nature of the messy problem facing them. This approach to understanding the nature of the problem facing the strategist and the planner helps in developing

solutions through the shared understanding between the two. The importance of Op Design is more in the initiation of the planning process and reduces as planning gathers momentum.<sup>54</sup> At its essence, it spends more effort in understanding the problem, rather than looking for solutions. That is the mark of 'strategist thinking' as opposed to the planner's solution driven thought.

The gradual exclusion of military men in India from national strategic decision-making processes and structures has been blamed on many things. These include change of business rules, inter-organisational rivalry, structural problems, and lack of wars, amongst some others. However, politicians are some of the smartest practising strategists. Unlike any other class, they fight 'campaigns' every few years, and so test their election and governance strategies at election time. They know enough about the essential arguments in multiple fields. While they could be prone to privileging short-term expediency over long-term benefit, they rarely take unreasoned decisions. So, the exclusion of the military from the highest decision-making entities may also have something to do with lack of meaningful advice in tackling wicked problems like those of national security. Reduction in the quality of advice is natural if the advice is being given by super specialist planners as opposed to educated multi-disciplinary strategic thinkers.<sup>55</sup> Organisations are especially prone to giving advice only within the repertoire of their own

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54. *Planner's Handbook for Operational Design* (Suffolk: Joint and Coalition Warfighting, 2011). Gen James Mattis, the new secretary of defence of the US, is a proponent of Op Design. It's also a bit ironic that the complex subject of Op Design has been reduced to a handbook! The origins of Op Design may lie in Fredrick Taylor's management theory.

55. Evidence of this cause and effect is unavailable due lack of open source historical records in India. However, such evidence is available in the case of the US, where records are more easy available. After Eisenhower, the US Service chiefs lost the trust of the Kennedy-Johnson Administration as their advice lost touch with the political imperatives. As per the award winning work by McMaster "the Joint Chiefs lost direct access to the president, and, thus, the real influence on decision-making that the Eisenhower NSC structure had provided.." H.R. McMaster, *Dereliction of Duty* (New York: HarperCollins, 1997), p.5. In India's case, the earliest leadership came from economically privileged backgrounds, with attendant educational advantage. For example, ACM PC Lal, a great thinker, had a diploma in journalism from King's College, London, and was attending the Bar at the Middle Temple when World War II caused a switch in careers. However, fortunately, even today, many generals are self-educated, making up in some measure, the organisation's lack of formal education in theory, history, and the 'arts.'

**Dealing with complexity requires more generalist knowledge as opposed to specialisation. One problem often flagged about India's Higher Defence Organisation (HoD) is that the Ministry of Defence (MoD) is staffed by generalist civilians. But, at the highest levels of strategising, a generalist scores over a specialist.**

output.<sup>56</sup> Not just Clausewitz, the political leader would also respect the general who understood policy with all its complexity.

Dealing with complexity requires more generalist knowledge as opposed to specialisation. One problem often flagged about India's Higher Defence Organisation (HDO) is that the Ministry of Defence (MoD) is staffed by generalist civilians. But, at the highest levels of strategising, a generalist scores over a specialist. While lack of specialisation, no doubt acts as an impediment in the decision-making quality of the MoD,<sup>57</sup> super-specialisation of the uniformed leadership, at the cost of

generalist knowledge may be a worse impediment. The ideal mix is one where the junior military leadership has specialised knowledge, while the level of generalist knowledge keeps increasing as the level of leadership rises.<sup>58</sup>

## CONCLUSION

This article is about strategy and strategists. It explores strategy first. It shows how the term means different things to different people, depending on the context. Strategy pervades life both horizontally in many disciplines and vertically in any discipline. One understanding is the *ends, ways, means,*

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56. Graham Allison and Philip Zelikow, *Essence of Decision* (New York: Longman, 1999), Air forces will tend to bomb problems, armies to capture it, while diplomats will see the use of force as a professional failure.

57. "Armed Forces Modernisation," p.5 at [http://visionias.in/beta/sites/all/themes/momentum/files/interview\\_issues\\_2016/Armed\\_Forces\\_Modernization.pdf](http://visionias.in/beta/sites/all/themes/momentum/files/interview_issues_2016/Armed_Forces_Modernization.pdf). Accessed on February 3, 2017.

58. While not explicitly articulating this need, the Indian military institutions of higher learning implicitly seem to acknowledge the need for broadening of horizons at higher levels of leadership. Thus, most long and short term courses like the Higher Command , National Defence College, etc have curricula which invite experts in diverse fields to talk about their domains. However, the institutions do not emphasise on educating students about the theories underlying these fields.

construct. In that sense, in the military realm, tactics, strategy, and grand strategy is all strategy. However, as the level of practice rises, the complexity of the problem rises, all three variables increase in scope, and everything becomes open ended. At these levels of problem solving, strategy becomes a “quest for continuing advantage” rather than victory in a particular battle. It also needs a different kind of thinking.

All strategy springs from the mind. So we need to explore how the mind works, and to make strategists, we need to know how it learns. A combination of life experience and education can improve strategic thinking. This education needs to be a combination of theory and history. The end result is the availability of enough analogies and schemas, and, more importantly, *ways of thinking*.

In the absence of the schemas enriched through education, the STEM type planner will default to tactical experience as his theory base, and linear thinking as his way of thinking. The end result may be the “Tactical General.”<sup>59</sup> This article is really about education. But it hasn’t really addressed the solution. Instead, it has spent effort in understanding the wicked problem of creating strategy and strategists. The solution(s) would be the subject of another article.

**All strategy springs from the mind. So we need to explore how the mind works, and to make strategists, we need to know how it learns. A combination of life experience and education can improve strategic thinking. This education needs to be a combination of theory and history. The end result is the availability of enough analogies and schemas, and, more importantly, *ways of thinking*.**

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59. The term was coined by P.W. Singer, *Wired For War: The Robotics Revolution and Conflict in the 21st Century* (New York: Penguin Books, 2009), p. 329. This also explains bar-room comments by pilots about some senior officers occasionally continuing to do the flight commanders’ job when occupying high chairs of responsibility. In these cases, the general is not only defaulting to earlier schemas in how he attempts new jobs, but also to what he is doing, by continuing to do the old job he is most experienced at. He chooses to see/solve tactical level problems over strategic level ones. However, I believe these are exceptions rather than the rule.

# INDIA'S HYDROCARBON POLICY: DIVERSIFICATION, DIPLOMACY AND DEALS

SAI DEEPTHI PAVANI

## INTRODUCTION

India's dependence on energy imports has been on an upward trend since the 1950s. From a country that was 50 percent self-reliant in oil, the figures of self-reliance today are close to negligible.<sup>1</sup> The growing demand of oil combined with the lack of resources and infrastructure for upstream<sup>2</sup> projects has placed an ever growing dependence on imports for its energy needs. In order to meet the high levels of consumption, India invariably depends on imports. Over two-thirds of India's energy demands are met by the Gulf countries. Saudi Arabia continues to be India's top oil supplier. Translating the relations into strategic energy cooperation in 2006, Saudi Arabia and India grew closer by increasing India's role in the energy stakes in oil and gas fields abroad. Today, India imports nearly 15.62 percent of its oil from Saudi Arabia, with the other top suppliers being Iraq, Nigeria,

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1. I.P. Khosla, *Energy And Diplomacy* (Delhi: Konark Publishers, 2005).
2. The oil and gas industry is divided into three sectors: upstream, which includes exploration and production; midstream which covers distribution; and downstream which comprises refining and processing



**During the period 2006-10 when the GDP was increasing at the Compounded Annual Growth Rate (CAGR) of 8.2 percent, India witnessed a subsequent rise in energy consumption by 142.8 Million Tonnes oil-Equivalent (MToE).**

United Arab Emirates (UAE), Qatar, Venezuela and Iran.<sup>3</sup>

It is evident that India relies heavily on imports from West Asia which majorly comprises the Arab and Islamic nation-states. This high dependence on imports from a highly conflicted region is tied to a high risk of price volatility. One of the reasons why India can be seen moving towards Central Asia for energy could be attributed to the fact that diversification of its energy sources would shield the country from being highly prone to shocks caused by regional conflicts. Removing potential hindrances to economic growth in the energy sector would benefit India since it is an emerging

economy. Before looking into India's energy cooperation with other nations, it is essential to examine the situation of India's energy demand as it exists and the likely increase in the coming years .

### THE DEMAND QUOTIENT

India is the world's third largest energy consumer, accounting for 4.4 percent of global energy consumption. With an average Gross Domestic Product (GDP) growth rate of 8 percent, India's energy dependence on oil and natural gas is predicted to grow in the near future. In 2015 alone, China and India were responsible for 55 percent of global growth in oil products consumption.<sup>4</sup> During the period 2006-10, when the GDP was increasing at the Compounded Annual Growth Rate (CAGR) of 8.2 percent, India witnessed a subsequent rise in energy consumption by 142.8 Million Tonnes oil-Equivalent (MToE).<sup>5</sup>

The growth in GDP is reflected proportionately in the consumption of coal, oil and natural gas. Coal, being the primary source of energy, is bound

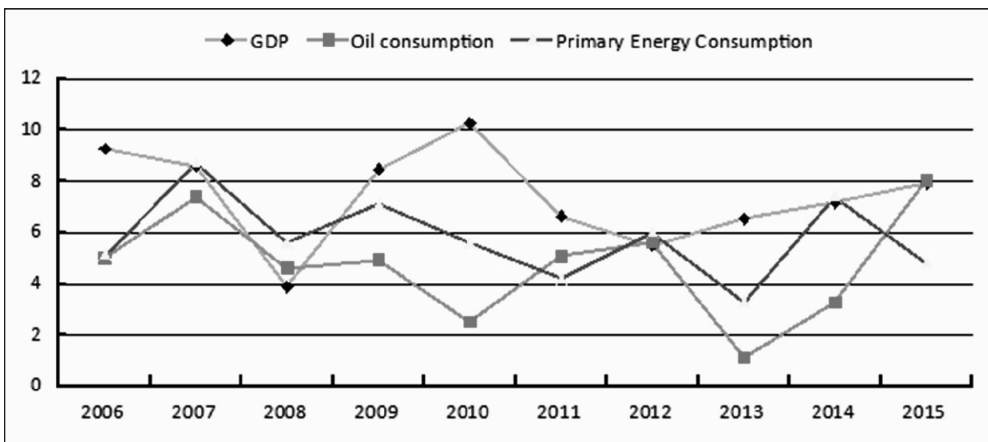
3. World Bank, "World Integrated Trade Solution," <http://wits.worldbank.org>. Accessed in 2017.

4. World Energy Statistics, "World Energy Consumption & Stats", 2016, *Yearbook.Enerdata.Net*. <https://yearbook.enerdata.net/#oil-consumption.html>.

5. World Economic Outlook Database; British Petroleum Statistical Review of Energy, 2011.

to have a direct impact, but the increase in oil is likely to be fuelled by the growth in GDP per capita. This growth in oil consumption, as a consequence of GDP per capita growth, can be attributed to the increased sales in the automobile industry.<sup>6</sup> Since the transportation sector accounts for 70 percent of the total petroleum consumption, the growth in the automobile industry is directly proportional to the oil demand in the country.<sup>7</sup> The oil consumption in 2015 increased by 8.1 percent, recording the highest ever growth, only to be again surpassed by an 11 percent growth in 2016.<sup>8</sup> From Fig 1 below, it can be observed that the general trend is that the primary energy consumption and oil consumption in the country was in line with the growth and fall in the GDP. The energy driven GDP growth will, thus, have a definite impact on the consumption of hydrocarbons.

Fig 1



The following factors are perceived to contribute to the increase in India's dependence on oil and natural gas.

6. Tsvetana Paraskova. "India's 2016 Oil Demand Jumps 11% To Record Highs: Oilprice.Com", *Oilprice.Com*, 2017, <http://oilprice.com/Latest-Energy-News/World-News/Indias-2016-Oil-Demand-Jumps-11-To-Record-Highs.html>.
7. Sanjeev Choudhary, "India's Dependence on Crude Oil Imports on Rise as Consumption Increases", *The Economic Times*, 2016, <http://economictimes.indiatimes.com/industry/energy/oil-gas/indias-dependence-on-crude-oil-imports-on-rise-as-consumption-increases/articleshow/51934359.cms>.
8. British Petroleum Statistical Review of World Energy, June 2016.

**According to the National Energy Map of India, a study commissioned by the Government of India and carried out by The Energy Resources Institute (TERI), it was planned to achieve 10 percent GDP growth rate by 2025. In order to achieve this, it was found that electricity generation needed to increase by five times.**

*The Slow Shift towards Oil and Natural Gas*

India's dependence on oil and natural gas primarily stems from the fact that 30 percent of its total energy needs are met by oil and natural gas.<sup>9</sup> Of course, this compares favourably with the fact that India draws nearly half of its energy from renewable sources of energy and from coal. India's dependence on coal is much greater than its dependence on oil for energy. In total, there are 65 gas-based thermal plants and 116 coal-based thermal plants in India.<sup>10</sup> But due to the growing sensitivity to environmental

concerns, countries are moving from 'unclean' sources of energy and, hence, oil and natural gas are seen as potential alternatives to coal. Wind and solar energy are renewables and cleaner, but due to the fact that industries related to petroleum products and refineries bring in large revenues through exports, economies cannot function without oil and natural gas.

According to the National Energy Map of India, a study commissioned by the Government of India and carried out by The Energy Resources Institute (TERI), it was planned to achieve 10 percent GDP growth rate by 2025. In order to achieve this, it was found that electricity generation needed to increase by five times<sup>11</sup>. Growth in electrification directly indicates the growth in dependence on thermal power which currently meets 68.3 percent of the demand.<sup>12</sup> The study had also recommended a shift to hydrocarbons for cleaner energy.

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9. International Energy Agency Statistics 2015.

10. "Power Sector at a Glance", Government Of India, Ministry of Power", 2017, <http://powermin.nic.in/en/content/power-sector-glance-all-india>.

11. Ramchandra Pode, "Addressing India's Energy Security and Options for Decreasing Energy Dependency," *Renewable and Sustainable Energy Reviews*, vol.14, 2010, pp. 3017 as cited in Vivek Dhall, 2013, *India's Energy Security*. 1st ed, (New Delhi: Vij Books India Pvt Ltd).

12. "Power Sector at a Glance," Government of India, Ministry of Power, 2017, *Powermin.Nic.In*. <http://powermin.nic.in/en/content/power-sector-glance-all-india>.

There has subsequently not only been a rise in the imports of crude oil but also an overall increase in the imports of petroleum products. In fact, these rose by 32.9 percent from 2015 to 2016. The demand in the country for petroleum products has increased, which has fuelled imports, thereby resulting in reduction in the export of petroleum products (one of India's primary export commodities) by over 5 percent in 2015, calling for a shift in the allocation of crude oil imports from producing petroleum products to domestic consumption, consequently adding up to the demand.<sup>13</sup>

### *Industries Dependent on Oil and Natural Gas*

In India, the economy is divided into three major sectors: services sector, manufacturing or secondary sector, and agricultural and allied or primary sector. Accounting for a total Gross Value Added (GVA) of 53.66 percent, the services sector is the major contributor to the economy followed by the industrial sector that contributes 29.02 percent, while the agriculture and allied sector's share is 17.32 percent.<sup>14</sup> Energy is used primarily for industries, transportation and domestic purposes. As of 2015, the manufacturing or industrial sector accounted for the largest share (44.11 percent) of electricity consumption, placing a direct bearing on the energy sector.<sup>15</sup> The fertiliser and power sectors consume natural gas at 30 and 21 percent respectively.<sup>16</sup> Industries and the services sector consume nearly half of the energy and for an economy with a GVA devoted to industries and the services sector, any interruption in the flow of energy towards these sectors, can damage growth to a great extent.

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13. Indian Petroleum and Natural Gas Statistics 2015-2016, Government of India.

14. India Bank Equity Foundation databank, <http://www.ibef.org/economy/economic-survey-2015-2016>. Accessed on May 16, 2017.

15. Central Statistics Office, Ministry of Statistics and Programme Implementation, 2016, *Energy Statistics 2016*, Government of India, [http://mospiold.nic.in/Mospi\\_New/upload/Energy\\_statistics\\_2016.pdf](http://mospiold.nic.in/Mospi_New/upload/Energy_statistics_2016.pdf)

16. V. Kumar, K. Rajesh and Dr. M. Vimala, "Energy Consumption In India-Recent Trends". *Asia Pacific Journal of Research I* (XXXVI), February 2016, <http://apjor.com/downloads/0203201620.pdf>.

**Despite the discoveries having combined reserves of nearly 10 trillion cubic feet (tcf), financial problems in the sector have warded off potential investors. Hence, domestic supply is not moving apace with the demand.**

### *Demand-Supply Gap*

Despite the government's efforts in building the upstream sector to make India self-sufficient, the country is not able to keep up with the growing demand. Two major reasons that contribute to the demand-supply gap are India's growing population and lack of adequate resources available in India to meet the demand. Growth in population, coupled with an emerging market economy drives the demand at a much faster pace. The Government of India had launched various initiatives towards decreasing the dependence on imports by funding exploration projects at home and abroad. However, the annual reports of the Oil and Natural Gas Corporation (ONGC) and Indian Oil Corporation (IOC) suggest a continual fall in the output production.

Prime Minister Modi has set a target of cutting oil import dependence by 10 percent in the next seven years in the hope to reverse the decline in domestic oil output through a slew of policy measures, fresh investments and technological interventions. A study by TERI shows that coal will continue to be the main source of energy but the dependency on oil and natural gas is recommended for a cleaner energy mix. This led to the emergence of Hydrocarbon Vision 2025 that aims to shift the focus to alternative sources of cleaner energy. The Vision focusses entirely on tapping the existing oil and natural gas resources in the country. It was framed in the context of utilising the strategic location of northeast India bordering five important neighbours (Myanmar, Bhutan, China, Nepal and Bangladesh) for building pipelines in the future. But the exploration plan currently faces strong opposition in the state of Manipur.

Under the exploration policies, the Indian government's major policy is the National Exploration Licensing Policy (NELP) under which the government provides Petroleum Exploration Licences (PEL) to companies and firms. Formulated in 1997, it aimed to attract capital into the

upstream sector from both public and private players by allowing 100 percent Foreign Direct Investment (FDI) in the oil blocks under the exploration process. The policy's success rate continues to be marginal considering the fact that of the 26 sedimentary basins in India, 80 percent remain completely unexplored.<sup>17</sup> It is believed that the policy will bring long-term benefits in the future but, currently, India's requirements need to be met by imports.

The dependence on natural gas imports is due to the power sector's growing demand.

There have been natural gas discoveries ranging from those in the Krishna-Godavari basins to

those in other regions in Orissa and Gujarat. Despite the discoveries having combined reserves of nearly 10 trillion cubic feet (tcf), financial problems in the sector have warded off potential investors. Hence, domestic supply is not moving apace with the demand. With states like Delhi and Maharashtra urging compulsory use of Compressed Natural Gas (CNG) cylinders, there is bound to be an increasing demand as well. The demand was last known to be 155 tcf while the supply along with imports was 83 tcf, but it is expected to grow to 400 tcf in the next 20 years. Though the reserves are expected to last for 30 years, they could never meet the demand even if all the reserves started production simultaneously.<sup>18</sup>

India's crude oil self-sufficiency has fallen drastically by more than 30 percent over the years.<sup>19</sup> Fig 2 below shows the consistent increase in the demand-supply gap when it comes to oil production and consumption.

**The major deal was the Rossneft-Essar deal by which 98 percent of acquisition of Essar oil will be carried out in return for major stakes in oil and gas fields. The summit reached new heights with regard to hydrocarbon energy cooperation.**

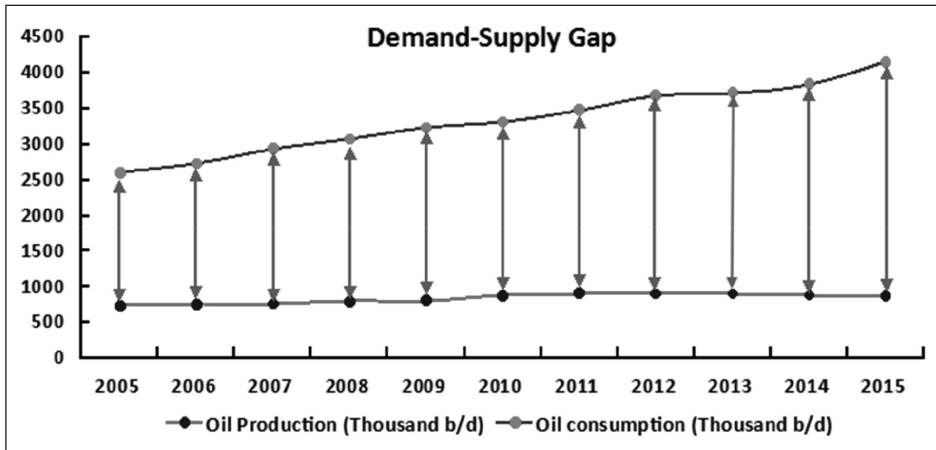
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17. Vivek Dhall, *India's Energy Security*, 1st ed (New Delhi: Vij Books India Pvt Ltd, 2013).

18. I. P. Khosla, *Energy And Diplomacy*. 1st ed. (Delhi: Konark Publishers, 2005).

19. World Economic Outlook Database, September 2011, International Monetary Fund.

Fig 2



Due to stagnation in the growth of the upstream sector, India invariably had to import its oil to sustain the economic growth over the years and will continue to do so as the domestic reserves and resources will not be able to supplement the growing demand.

### INDIA'S EMERGING ENERGY PARTNERS

West Asia which is India's major supplier of energy, remains crucial due to the region constituting a major share of global energy reserve. However, the ongoing political developments in West Asia and India's interests and complex relations with individual nations in the region, have led it to reach out to other nations and in particular, Russia and the Central Asian nations as an alternative source of energy. The new outreach extends to Central Asia, which accounts for major oil and natural gas reserves in the world, as also to Russia, which is known for its infrastructure in pipelines along with its energy reserves.

#### *Russia*

Energy cooperation with Russia can be dated back to the post-independence era when the Soviet Union helped India build the basic infrastructure for refineries and became the largest oil supplier to India. Soon after the Soviet disintegration, bilateral energy relations came to a near halt. The cooperation

was revived from 2000 onward when the nations came together to sign the strategic bilateral cooperation agreement and from then on, Russia has supported India by providing access to infrastructural developments and helped Oil and Natural Gas Corporation Videsh Limited, the foreign wing of India's oil exploration company ONGC, in acquiring stakes in major oil and gas fields abroad. The relations reached new heights at the India-Russia Annual Summit 2016 when Russian President Vladimir Putin met with Prime Minister Narendra Modi to sign energy deals. Through the meeting, the nations envisioned a framework for a natural gas pipeline that could make Russia a primary natural gas supplier to India. There was also an increase in the stakes for Indian companies in oil and gas fields in the Arctic and Baltic regions.<sup>20</sup> The major deal was the Rosneft-Essar deal by which 98 percent of acquisition of Essar oil will be carried out in return for major stakes in oil and gas fields. The summit reached new heights with regard to hydrocarbon energy cooperation.

**India's transnational pipeline projects will play a crucial role in India's energy security equation, and the partnership it can build with Russia—for building pipelines infrastructure—and the Central Asian nations, is a means to that end.**

### *Prospects in Central Asia*

India describes Central Asia as its extended neighbourhood. The lack of direct connectivity to the region has been a constraint in establishing relations but India is trying to overcome this through initiatives like the International North-South Transport Corridor (INSTC), a corridor connecting India to the Central Asian regions through the Iranian Bandar Abbas port and from there on connecting by road to the Russian Astrakhan port to other regions. This route is said to reduce the time loss by 40 percent. Materialisation of the corridor could widen the prospect of Central Asia as an energy source. India's major energy partners in

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20. Dipanjan Chaudhury, "India And Russia May Agree to Create an 'Energy Bridge'", *The Economic Times*, 2016, [http://economictimes.indiatimes.com/articleshow/54684635.cms?utm\\_source=contentofinterest&utm\\_medium=text&utm\\_campaign=cppst](http://economictimes.indiatimes.com/articleshow/54684635.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst).



**The deal sprang up again in 2012 when the South Asian Gas Enterprise (SAGE)—India took up the project on a broader scale of creating an energy corridor. The pipeline, now renamed as the Middle East-India Deepwater Pipeline (MEIDP), will be an underwater pipeline, bypassing Pakistan, transporting 8 tcf over 1,300 km of pipeline.**

the region are Kazakhstan, Turkmenistan, Uzbekistan and Tajikistan. Starting with the visit of Prime Minister Manmohan Singh, India started to import uranium and hydrocarbons from these areas. The 2011 energy deal with Kazakhstan gives India 25 percent stake in the Satpayev oil block.<sup>21</sup> Since then, Uzbekistan and Turkmenistan have also signed deals with India with regard to a strategic partnership. The most recent was Prime Minister Narendra Modi's visit to the Central Asian region during which India managed to sign deals with regard to uranium, and the exploration in Satpayev started.<sup>22</sup> Turkmenistan has the fourth largest gas reserves in the world while Kazakhstan holds the world's twelfth largest oil deposits and has the third largest gas reserves in the region. Tajikistan and Kyrgyzstan have exhibited great potential for hydropower.<sup>23</sup>

India's transnational pipeline projects will play a crucial role in India's energy security equation, and the partnership it can build with Russia—for building pipelines infrastructure—and the Central Asian nations, is a means to that end. The following section would look into some of the major energy deals undertaken by India and in particular the major pipelines projects.

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21. Amiya Chandra, *India-Central Asia Relations: The Economic Dimension*, (Pentagon Press).

22. Sameer Patil, "After Modi's Visit, Is Central Asia Open For Indian Business?", *The Diplomat*, <http://thediplomat.com/2015/07/after-modis-visit-is-central-asia-open-for-indian-business/>.

23. Manish Vaid, "India's Energy Diplomacy In Central Asia Could Challenge China's Monopoly," *ORF*, <http://www.orfonline.org/research/india-energy-diplomacy-central-asia-challenge-china-monopoly/>.

## THE ENERGY DEALS

### *Iran-Pakistan-India Pipeline Project (IPI)*

The Iran-Pakistan-India (IPI) pipeline project is a natural gas pipeline which was proposed to export gas from Iran to Pakistan. Iran later offered to extend the pipeline to India and export gas to India via Khuzdar in Pakistan and extending it to Multan to reach India; thus, covering a distance of nearly 2,775 km from Iran's South Pars gas field in the Persian Gulf. Another branch of this pipeline would further extend to Karachi.<sup>24</sup> The proposed

pipeline project was known as the "Peace Pipeline" which would transport 90 million metric standard cubic metres (mmscmd) to India. However, years of tensions between India and Pakistan have stalled the project and the impact of UN sanctions on Iran buried the pipeline project even before it was built.

### *Turkmenistan-Afghanistan-Pakistan-India Pipeline Project*

Another project in the making has been the Turkmenistan-Afghanistan-Pakistan-India (TAPI) pipeline project proposed by the US as an alternative to IPI. Both Pakistan and India were persuaded to switch to TAPI for gas. The TAPI pipeline will supply 33 mmscmd to India through a 1,814 km pipeline via Afghanistan and Pakistan.<sup>25</sup> The pipeline faces challenges since it has to pass through the Af-Pak and Balochistan regions, which are known to be highly turbulent. The project had kicked off with Turkmenistan finishing its part of the pipeline successfully but it hasn't progressed any further.

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24. Sagarika Dutt and Alok Bansal, *South Asian Security*, 1st ed. (London: Routledge, 2015).

25. Reza Yeganehshakib, "Iran-India Energy Cooperation Opens New Horizons", *Al-Monitor*, 2016, <http://www.al-monitor.com/pulse/en/originals/2016/01/iran-india-oman-gas-pipeline-meidp-vs-tapi.html>

Fig 3

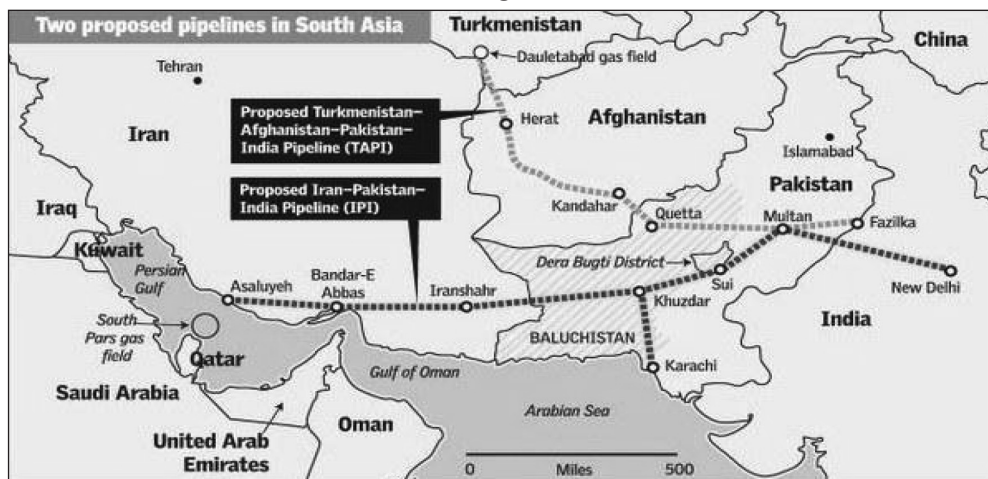


Image source: The Hindu BusinessLine

### *Oman-India Sub-Sea Pipeline*

The sub-sea pipeline which will draw gas from Oman was proposed in 1995 but was shelved due to technological inadequacies. The deal sprang up again in 2012 when the South Asian Gas Enterprise (SAGE)—India took up the project on a broader scale of creating an energy corridor. The pipeline, now renamed as the Middle East-India Deepwater Pipeline (MEIDP), will be an underwater pipeline, bypassing Pakistan, transporting 8 tcf over 1,300 km of pipeline. This could also connect India to Iran without having to go through Pakistan if the corridor is completed. The rest of the energy corridor would connect Oman's port to Iran and other Central Asian regions. Thus, the major advantage that India would gain through the materialisation of this project would be uninterrupted access to Iran and Central Asia.

There is a massive political stronghold underpinning the diplomacy towards the realisation of energy pipeline projects. The sequence of the diplomatic events involved in the emergence of TAPI and MEIDP emerged as alternatives to IPI, exploring the factors that shifted India's focus from IPI to TAPI. India is trying to revive the shelved deal through MEIDP, as discussed in the following section.

## DIPLOMATIC DIMENSIONS OF INDIA'S PIPELINE PROJECTS

In the years following the oil shock, India worked towards securing its supply through a process of diversification in order to expand its sources of oil and natural gas. The move was preceded by the high amount of instability that the shock brought to the nation. This was when the Indian energy sector was suffering from volatility which prevailed in the international oil market. The volatility was largely driven by the fact that many of India's major exporters were in West Asia whose oil production was affected due to the political instability which prevailed in the region. In particular, India's major oil exporter, Iran, which post-revolution in 1979 witnessed the wrath of the Western nations in the form of heavy sanctions. This compelled India to balance the major oil producing nations in West Asia, thus, courting both Saudi Arabia and Iran in order to meet its energy needs.<sup>26</sup>

**The IPI deal came to a standstill when Pakistan refused to extend the pipeline to India but resurfaced when Pakistan realised that it had to look for potential importers in order to meet its domestic needs.**

### *1995 and the Process of Diversification*

The year 1995 was important as it marked the beginning of talks on the US sanctions on Iran and Libya. The sanctions were ratified in the year 1996 but the process for disengaging ties with Iran had started much earlier when the shah of Iran was suddenly portrayed in the Western media as an "oppressive leader". The fall of the shah was a guided response by the US to tackle the nationalisation of oil and gas firms – a move which could put an end to the EU's and US' stakes in the Iranian oil and gas industries. It is necessary to study the background of Iran-US relations in order to show how India diplomatically shuttled between the two nations when the IPI pipeline was being negotiated.

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26. Aras et al., "India's Dilemma in the Arab Spring", *Project on Middle East and the Arab Spring*, 2015.

**With regard to TAPI, India now pays three times more than what was agreed on with IPI. Before India withdrew from the Iran pipeline, India was negotiating a deal at \$7 billion dollars, including the transit fees to Pakistan.**

This was around the same time that India realised that it would not be able to sustain itself if it depended on the domestic production of oil and natural gas. Hence, it started looking outwards and building its relations with Central and West Asia, with the intention to meet its energy requirements through imports. India's move was further strengthened due to its long-term bilateral relations with these nations.

In 1995, India took initiatives to become part of the Iran-Pakistan pipeline project which was already being negotiated with Pakistan. Initially designed to supply gas till Pakistan, India's interest in the pipeline accentuated the tensions between India-Pakistan and stalled the deal from progressing due to Pakistan's reluctance and India's own security concerns. Pakistan's relations with India also hindered the deal from getting materialised. The IPI deal came to a standstill when Pakistan refused to extend the pipeline to India but resurfaced when Pakistan realised that it had to look for potential importers in order to meet its own domestic needs. Every ceasefire exchange shot down the prospects of establishing relations and raised suspicions over leaving the pipeline under Pakistan's guard. Pakistan's strategic link with the West and Central Asian regions has posed a challenge which India has been trying to bypass by constructing pipelines via Oman. The US embargo on Iran had reduced its market in Europe and the US and, thus, Iran began to seek new markets.<sup>27</sup> This is when events in the South Asian region presented a great opportunity to Iran. Further, India's economic liberalisation had made India emerge as a major importer of energy in order to fuel its growth.

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27. "How Sanctions Affect Iran's Economy," CFR.org. Council on Foreign Relations, May 23, 2012. Web, May 1, 2017.

*India's Relations with the US and the Impact*

Economic liberalisation, in addition to expanding trade, had largely attracted Western players like the US. The increasing economic relationship between India and the West, also to a large extent, influenced India to vote on the International Atomic Energy Agency (IAEA) sanctions Bill in 2005. India's action at the UN was quoted by numerous Washington officials as a success in India being "coerced".<sup>28</sup> Condelezza Rice, the then US secretary of state, on numerous occasions had expressed concerns about India-Iran ties, thereby exerting pressure on the country.

The voting that India had participated in, in the United Nations Security Council (UNSC) from 2005 with respect to nuclear proliferation was, thus, construed by many as India taking an anti-Iran stand and bending to US pressures. Iran too showed its displeasure when, right after the vote, Tehran called off the Liquefied Natural Gas (LNG) deal and it was communicated by the Iranian Foreign Ministry spokesman that "Iran will revise these (economic) relations and these countries (that voted against Iran) will suffer. Our economic and political relations are coordinated with each other"<sup>29</sup>

India subsequently withdrew from the deal quoting "price, fees and security concerns" as the factors. With regard to TAPI, India now pays three times more than what was agreed on with IPI.<sup>30</sup> Before India withdrew from the Iran pipeline, India was negotiating a deal at \$7 billion, including the transit fees to Pakistan. The supposed deal that India withdrew from was formulated to have gas priced at around \$7 per million British thermal units (mBtu) at the Indian border but was said to rise by 40 percent due to the rise in oil prices. Now, India is negotiating for a price of \$10 mBtu at the Indian border while Turkmenistan wants \$12 per mBtu at its border and the entire project is estimated to cost \$10 billion. With TAPI, India would be paying more than double the domestic gas price<sup>31</sup>.

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28. Siddarth Varadarajan, "India's Anti-Iran Votes Were Coerced, Says Former U.S. Official", *The Hindu*, 2007, <http://www.thehindu.com/todays-paper/tp-national/Indias-anti-Iran-votes-were-coerced-says-former-U.S.-official/article14721223.ece>.

29. Amit Baruah, "A Test for India's Foreign Policy," *The Hindu* (Madras), September 1, 2005.

30. Dutt and Bansal, n. 24.

31. Rakteem Katakey, "India Skips Crucial Meet on IPI Pipeline", *Business Standard*, 2008, [http://www.business-standard.com/article/economy-policy/india-skips-crucial-meet-on-ipi-pipeline-108100201074\\_1.html](http://www.business-standard.com/article/economy-policy/india-skips-crucial-meet-on-ipi-pipeline-108100201074_1.html).

US influence on Iran-India relations did not end with the vote. The US also took steps to curtail the financial mechanisms through which India conducted trade with Iran. The US opposed conduct of transactions with Iran through the Asian Clearing Union (ACU), a regional integration of central banks which facilitates easier movement of trade and foreign exchange among the member nations. According to Shebonti Dadwal<sup>32</sup>, this was done when the US expressed concerns over the “opaque” nature of the organisation, restricting the chances of tracing if and whether the money is going into Iran’s nuclear proliferation programme. However, these claims were rebutted by the Reserve Bank of India (RBI) saying that the move was made to facilitate better trade exchanges.<sup>33</sup> India then adopted two other payment mechanisms which were again quashed. This forced many oil companies which were dependent on Iran’s imports to diversify their sources, resulting in a fall of oil imports since 2011. This laid down the foundation for the debt repayment crisis that built up tensions between India and Iran. The crude oil imports from Iran fell by 24 percent in the first 11 months. India’s imports that stood at 259,000 barrels per day (bpd) of oil as of 2013 showed a near 43 percent decline from the previous year.<sup>34</sup> Iran fell from being India’s second largest oil importer to the sixth, following the sanctions.

As exaggerated as the reports that followed the vote may seem, India’s stand had not affected the relations such that they would hit rock-bottom. In 2013, there was a growth in the imports which was again followed by a decline in 2015 right after the Joint Comprehensive Plan of Action (JCPOA) Bill was passed. The decline was not primarily due to US pressure but due to the fact that the channels of foreign exchange were repeatedly blocked, thus, holding off the investors over taking potential risks.

The US, in the meantime, had started promoting its energy alternative, TAPI, to both India and Pakistan. With the signing of the civilian nuclear

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32. Shebonti Ray Dadwal, “Rajat Dubey Asked: Why Did India Decide to Withdraw From ACU? How Will The New Agreement With Iran Solve The Problem?”, Institute For Defence Studies and Analyses”. *Idsa.In*. Accessed on May 3. <http://www.idsa.in/askanexpert/withdrawfromACU>.

33. “RBI Claims ACU Ban Will Ease Oil Imports”, *The Hindu*, 2011, <http://www.thehindu.com/business/Economy/RBI-claims-ACU-ban-will-ease-oil-imports/article15513222.ece>.

34. Nidhi Verma. March 8, 2013. “Exclusive: India Set To Halt Iran Oil Imports Over Insurance - MRPL”, U.S.. <http://www.reuters.com/article/us-iran-india-imports/exclusive-india-set-to-halt-iran-oil-imports-over-insurance-mrpl-idUSBRE9270BP20130308>.

deal with the US, India was being offered more than one source of energy security if it backed out of IPI. The US' strategy could be perceived as being aimed to reduce India's oil and energy dependence on Iran. One major reason was that Iran's economy would be crippled if its oil exports were hit thereby, cutting off the source of revenue supporting the enrichment programmes.

While Pakistan was also being pressured by the US to choose TAPI instead of IPI, Iran hastened to sign the deal with Pakistan before it could bend. Iran had also commented that if India did not respond favourably, the deal would be offered to other regional powers.

True to the threats, the deal was sold eventually to Russia in exchange for electricity which it will now export to Mongolia, China and Europe from Pakistan. But Russia has not limited itself to IPI; it has extended its support to Pakistan in TAPI also.

It can be seen with that even with respect to relations with Iran, India chose energy over politics. India's policy shifts were on similar lines during the Saudi Arabia-Iran conflict as well.

### *Post-Lifting of the Sanctions on Iran*

After the sanctions were lifted, talk of reviving the IPI pipeline had surfaced in India. Except this time, India wishes to draw gas from Iran through the Oman port instead, where the MEIDP has already started apace. But India is caught up in a row over Iran's Farzad B natural gas field. The Farzad B natural gas field, which is a recently discovered gas field, holds a crucial link to the entire pipeline project all over again as, if India does not get the rights, these would be sold to China. The gas field was discovered by the Indian consortium ONGC Videsh during the sanctions period which made it difficult for it to get permission to develop the field. Iranian envoy

**With the signing of the civilian nuclear deal with the US, India was being offered more than one source of energy security if it backed out of IPI. The US' strategy could be perceived as being aimed to reduce India's oil and energy dependence on Iran. One major reason was that Iran's economy would be crippled if its oil exports were hit.**



**India is also engaged in building its own energy corridor to Europe through Turkmenistan known as the North-South Transport Corridor. The corridor will connect India, Iran, Russia, Europe and Central Asia by various routes and, hence, the energy pipelines form the crux of the diversification process.**

Gholamreza Ansari, in an interview, stated that India had not responded favourably to Iran's offers during the sanctions period and had kept silent over the entire deal despite Iran's efforts.<sup>35</sup> With the sanctions lifted, Iran wished to open the deal for other competitors. India, which considered itself as the sole winner of the deal, grew wary. The row escalated further with the Indian government deciding to cut back on imports by 25 percent to which Iran's Oil Minister Bijan Zanganeh responded by saying that Iran would not sign the deal over threats. He further added that Iran's competitive oil and gas market would not lose much as it had other buyers even if India cuts back its

imports. India currently, the second largest importer after China, is trying to expand its presence in West Asia, thus, winning the deal is of strategic importance to it.

With China entering the equation, India's policy towards Iran has shifted from conducting relations to promising to cut down imports. This policy can be looked into from the context of combating the geo-political threat that it faces.

### *Combating Chinese Influence*

China's Belt Road Initiative (BRI) which it has been pursuing fervently to expand its markets in South Asia, Southeast Asia, and the European region, will play a key role with respect to the deal. China had recently inaugurated the China-Pakistan Economic Corridor (CPEC) and is strengthening its economic ties with Pakistan. The realisation of the economic corridor would

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35. Nayanima Mishra, "India Must get Assertive on Farzad B Gas Project", *The Hindu*, Business Line, 2017, <http://www.thehindubusinessline.com/news/national/india-must-get-assertive-on-farzad-b-gas-project/article9560341.ece>.

require a heavy investment in the generation of energy. Realising this, China has offered to help cover the costs in the Iran-Pakistan Pipeline<sup>36</sup>. The project that comes under the One Belt One Road (OBOR) initiative will help to bring about infrastructural development in Pakistan. As part of the project, China had also offered to pay \$2 billion to build a gas pipeline from Iran to Pakistan, reviving the peace pipeline.<sup>37</sup> If the pipeline materialises, it would reap benefits for both China and Pakistan.

The intention of the OBOR initiative, apart from expanding China's reach into new markets, is also to secure China's energy demand. Currently, the demand for gas in China is over 35 percent, and the International Energy Agency (IEA) predicts a 20 percent rise in the imports by 2055. Therefore, China is looking for resources in West and Central Asia through the OBOR.<sup>38</sup> After the CPEC was announced on April 2015, talks began to surface on a India-Iran pipeline that bypasses Pakistan. This can be seen as a measure put forward by India to combat the threat posed by growing China-Pakistan relations.

India's opposition to the OBOR initiative is majorly due to the CPEC passing through the Gilgit-Baltistan region which is a region of disputed territory between India and Pakistan. India perceives this as a move recognising Pakistan's sovereignty over the disputed territory, although the Chinese officials deny the political undertone of CPEC, calling it purely "economic". However, India boycotted the OBOR Summit held in May 2017 and so far, India and China haven't settled on energy agreements of any kind. Rather, both are competing with one another when it comes to securing their energy supplies.

India is also engaged in building its own energy corridor to Europe through Turkmenistan known as the North-South Transport Corridor. The corridor will connect India, Iran, Russia, Europe and Central Asia by various routes and, hence, the energy pipelines form the crux of the diversification

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36. Press releases as found on [cpec.gov.pk](http://cpec.gov.pk).

37. Sohail Bhatti, "Chinese Company to Build LNG, Gas Pipeline Projects in Pakistan", *Dawn*, 2015. Available at: <https://www.dawn.com/news/1209970>. Accessed on May 22, 2017.

38. Jude Clemente, "China's Rising Natural Gas Demand, Pipelines, and LNG", *Forbes.Com*. <https://www.forbes.com/sites/judeclemente/2016/04/24/chinas-rising-natural-gas-demand-pipelines-and-lng/#6203a53b5d00>.

**The fear of Pakistan holding the IPI hostage in the future cannot be ruled out. Of course, Pakistan and Iran are under the observer status in the 1994 Economic Charter Treaty which prohibits states from disrupting the supply of energy products even when in dispute.**

process, and India's energy relations with its emerging partners such as Russia and Central Asian nations become crucial.

#### **CHALLENGES AND INDIA'S OPTIONS**

As laid out in the paper, there would be a continuous increase in India's energy demand. Poor domestic production capacity along with the various diplomatic challenges that limit the fulfillment of India's energy needs, as well as security challenges will continue to riddle the sector.

The challenges that India's energy sector faces are huge, owing to the shifting dynamics in the Oil Producing and Exporting Countries (OPEC). In the recent OPEC meeting held in November 2016, the countries were asked to cut down their production in order to bring about a rise in the slumping international oil prices—this could again impact domestic oil prices in India which is heavily dependent on imports.

#### *Volatility in West Asia*

The volatility of oil prices in West Asia stems from the fact that oil is not just an economic commodity but one of strategic importance. This is what differentiates West Asian oil from that of other regions. The involvement of great powers such as France, the US, Russia and Britain in the politics of West Asia complicates the game due to the ongoing Arab-Islam conflict in the region. West Asia has been India's partner in energy for the longest time but interests in the region have always been influenced by the threats of instability. West Asia is highly prone to attacks and conflicts due to its resources and the large number of terrorist activities in the region.

#### *Lack of Connectivity with Central Asia*

Central Asia has been India's "extended neighbour" and the term 'extended' plays a major role in establishing how India lacks connectivity with the

region. Afghanistan and Pakistan are India's immediate neighbours on the northwestern front. Which means that India has to pass Pakistan and Afghanistan to reach out to Central Asia. India has tried to tackle this by having good relations with Iran which also shares a border with Central Asia. By taking the sea route to Chabahar port, India will be able to bypass Pakistan.

#### *Pipeline Security and Politics*

There have been numerous cases of pipeline explosions by the Baloch Liberation Army (BLA) in Balochistan. The BLA claimed responsibility for the blasts in Pir Koh and Dera Bugti. With the proposed pipelines going through the region, concerns over the physical security of the pipeline projects crop up time and again. There is also a perceived threat of blockades that must be taken into account as Russia which holds a major stake in the project has in the past used blockades as a strategy to counter Ukraine. The fear of Pakistan holding the IPI hostage in the future cannot be ruled out. Of course, Pakistan and Iran are under the observer status in the 1994 Economic Charter Treaty which prohibits states from disrupting the supply of energy products even when in dispute. Pakistan would only jeopardise its chance of getting a permanent membership under the charter if it ever engages in such acts. But nevertheless, the threat of blockades remains a theoretical possibility, however remote.

#### **INDIA'S OPTIONS**

The government, in addition, to improving investments in the upstream sector must also build a mechanism to shield the country from oil shocks as it has been established that India would be dependent on imports in the coming years. One of the common ways is to diversify its imports, hence, distributing the risk. India is seen doing this. Another way is to create buffer stocks that help cover the demand and stabilise the surge in energy

**Overall, the Indian government's approach towards tackling the energy demand-supply problem has been towards engaging more with the hydrocarbon-rich countries in order to sustain its GDP growth.**

prices. This can only be achieved if the infrastructure in the upstream and middle stream sectors is well endowed. Thus, the need emerges for India to continue with its traditional engagement with West Asia whilst, at the same time, devising new ways and means to counter the uncertainty by building new partners in Central Asia and attaining knowhow for the development and execution of pipelines from partners like Russia.

Overall, the Indian government's approach towards tackling the energy demand-supply problem has been towards engaging more with the hydrocarbon-rich countries in order to sustain its GDP growth. While India is pursuing energy pipelines, the challenges that it had faced with the previous pipelines like IPI seem to have been overcome with the advancement of new and alternative technologies that have made undersea deepwater pipelines a reality by pursuing the Middle-East India Deepwater Pipeline (MEIDP) project, bypassing Pakistan. Prioritising TAPI over IPI, if done under the influence of the US, shows India's diplomatic struggle to strike a balance between Iran and the US. After getting closer to the US for energy cooperation, India is now trying to revive the shelved IPI deal in order to gain access to its newly discovered fields in Iran. India is now seen pursuing MEIDP in this accord.

On the diplomatic front, India's engaging with the hydrocarbon-rich countries is in accordance with the geopolitical threats that the country faces from the growing China-Pakistan energy relations. The canvas remains full of challenges. India's drive towards diversification of hydrocarbon imports and deft diplomacy will have to save the day for India's energy future.

# EVOLUTION OF US POLICY ON CLIMATE CHANGE: FROM PRESIDENT OBAMA TO PRESIDENT TRUMP

ISHKA YADAV

## WHAT IS CLIMATE CHANGE?

The US Department of Ecology defines climate as the “*average weather*” in a particular place. It consists of markings of precipitation (rain and snow), temperature, wind, humidity and seasons...<sup>1</sup> Due to man-made causes, the prevailing climate in the last few decades has changed rapidly: this phenomenon is known as climate change. The change can be characterised as, “The increasing levels of carbon dioxide, methane and nitrous oxide have increased the Earth’s temperature, which is leading to melting of glaciers, droughts and rising sea levels...”<sup>2</sup> While Climate Change (CC) is a relatively new phenomenon, its genesis can be traced back to the 1800s during the era of the Industrial Revolution. The issue actually owes its origin to the

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1. “What is Climate Change”, Department of Ecology: State of Washington, Official Website, Available at <http://www.ecy.wa.gov/climatechange/whatis.htm>. Accessed on August 18, 2017.
2. “Preparing for a Changing Climate”, Department of Ecology: State of Washington, April, 2012 Available at <https://fortress.wa.gov/ecy/publications/publications/1201004b.pdf>. Accessed on August 18, 2017.

**In the year 1859, John Tyndall, an Irish physicist, discovered that carbon dioxide, ozone, and water vapour absorbed heat radiation; he subsequently argued that variations in carbon dioxide and water vapour could lead to a possible change in environmental conditions which later came to be known as climate change.**

environmental movement in the US and worldwide. It is for this purpose that a brief overview of the history of environmentalism in the US becomes imperative.

It is argued by scientists that the Industrial Revolution contributed to climate change by an increased level of carbon dioxide, methane, and nitrous oxide in the atmosphere by activities such as burning of coal and deforestation during 1800-70. In the year 1859, John Tyndall, an Irish physicist, discovered that carbon dioxide, ozone, and water vapour absorbed heat radiation; he subsequently argued

that variations in carbon dioxide and water vapour could lead to a possible change in environmental conditions which later came to be known as climate change.<sup>3</sup> In the 1870s, a second Industrial Revolution further accelerated the growth of fertilisers and synthetic chemicals such as nylon, rayon, and polyester which led to further environmental degradation.<sup>4</sup> This change in the environment was recognised by the environment movement, already emerging in the US and elsewhere such as in the United Kingdom, with the birth of conservation groups such as the Common Preservation Society, Royal Society, Kyrle Society for the Protection of Birds (RSPB) and Garden City movement.<sup>5</sup>

### **ENVIRONMENT MOVEMENT IN THE UNITED STATES OF AMERICA**

In the United States, the birth of the environment movement can be traced to the 1850s when Henry David Thoreau published the book, *Walden* (1848) that raised awareness about environmental sensitivity. In the subsequent

3. Steve Graham, "John Tyndall (1820-1893)", Nasa Earth Observatory, Official Website, October 8, 1999, Available at <https://earthobservatory.nasa.gov/Features/Tyndall/>. Accessed on July 9, 2017.
4. Rachel Carson, *Silent Spring* (Cambridge, Massachusetts: The Riverside Press, 1962), pp. 16, 21.
5. Dhanasree Jayaram, *Breaking Out of the Green House: Indian Leadership in Times of Environmental Change* (New Delhi: KW Publishers Pvt Ltd, 2012), p. 114.

years, another environment thinker, John Muir created an environmental organisation in San Francisco, known as the Sierra Club on May 28, 1892.<sup>6</sup> As an environmental organisation, the Sierra Club became one of the most prominent organisations for activism and eventually contributed to the protection of millions of acres of wilderness, and was further responsible for the enactment of powerful laws such as the Clean Air Act (1970), Clean Water Act (1972) and Endangered Species Act (1973).<sup>7</sup>

The environment movement was recognised by US presidents. For example, in 1916, President Woodrow Wilson founded the National Park Service, which exhibited the major milestones of environmentalism. In fact, during the during the 1920s and 1940s, two significant events – the opening up of the oil fields in Texas and the use of the Dichlorodiphenyltrichloroethane (DDT) pesticide and its disastrous effects on the ecosystem – were issues that played a big role in shaping up environmentalism in the US.<sup>8</sup> In fact, by the year 1945, the US Office of Naval Research began funding several fields of science, some of which helped in understanding environmental concerns.<sup>9</sup> The environmental impacts such as water degradation, air pollution, and destruction of wildlife habitats started creating awareness among the people and the government. All this led to the establishment of major environmental laws in the US from the 1960s.

### *The Making of Major Environmental Policies in America*

While there existed much awareness about environmental issues in the 1800s and the 1940s, it can be argued that actual environmentalism in the US began only in the 1960s. In 1960, an American marine biologist, Rachel Carson, published a book, called *Silent Spring* which created widespread awareness in the US about the use of DDT and how it was posing a threat to the ecology as well as human health. In 1972, due to public concerns about DDT,

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6. Ibid.

7. "Who We Are", Sierra Club, Official Website. Available at <http://www.sierraclub.org/about>. Accessed on July 9, 2017.

8. "Texas in the 1920s", Texas State Historical Association (TSHA), Official Website, June 15, 2010, Available at <https://tshaonline.org/handbook/online/articles/npt01>. Accessed on 9 July 2017.

9. "The History of Climate Change", *Live Science*, January 31, 2007. Available at <https://www.livescience.com/1292-history-climate-change-science.html>. Accessed on July 9, 2017.



**It is said that the United States experienced the “golden era” of environmental lawmaking from 1964-80. In 1964, during the Administration of President Lyndon Johnson, the US Congress passed 22 crucial laws concerning pollution control, wildlife, and management of public and private lands. The pollution control laws expanded the power of the government and gave the federal government a major role in protecting and upgrading the water and air quality.**

to the environmental laws.<sup>11</sup>

the Environmental Protection Agency (EPA) banned its use<sup>10</sup> It is said that the United States experienced the “golden era” of environmental lawmaking from 1964-80. In 1964, during the Administration of President Lyndon Johnson, the US Congress passed 22 crucial laws concerning pollution control, wildlife, and management of public and private lands. The pollution control laws expanded the power of the government and gave the federal government a major role in protecting and upgrading the water and air quality. The environmental movement of the 1960s and 1970s not only raised many questions for the implementing agencies but also created various opportunities and spaces for action for the US Congress, and the courts in giving meaning

The climate change policies of the American presidents show the different perceptions of the two political parties towards climate change, though climate change was a matter of concern for both Republicans and Democrats. In 1969, the US saw environmental policies being enacted to tackle climate change. President Nixon introduced the National Environment Policy Act (NEPA) in 1969, with the aim to protect the environment and biosphere, galvanise the welfare and health of man, and create a Council on Environmental Quality. A Cabinet Committee on Environment was also set up in 1970.<sup>12</sup>

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10. Jayaram, n.6, p. 114.

11. Christopher Mc Grory Klyza and Davis Sousa, *American Environmental Policy, 1990-2006 Beyond Gridlock* (Champaign, Illinois: Massachusetts Institute of Technology, 2008), pp. 1-2.

12. National Environmental Policy Act (NEPA), (1970), “Public Law 91-190-Jan. 1, 1970” - US GPO, Available at <https://www.gpo.gov/fdsys/pkg/STATUTE-83/pdf/STATUTE-83-Pg852.pdf>. Accessed on July 11, 2017.

On April 22, 1970, the first Earth Day was celebrated in which more than 20 million Americans participated. In the following year, 1970, President Nixon officially established the Environmental Protection Agency (EPA). The EPA was a big development in the environmental history of the US, as the agency started regulating laws on serious environmental issues such as air, water, and land pollution which were degrading the environment and human health. The agency's tasks included federal research, enforcement activities and monitoring.<sup>13</sup> Nixon also proposed the formation of the National Oceanic and Atmospheric Administration (NOAA) for protecting lives and property from natural disasters.<sup>14</sup> On December 31, 1970, the Clean Air Act was passed wherein the American Congress authorised the EPA to set emission standards for the gases responsible for climate change such as hydrocarbons, carbon monoxide, and nitrous oxide. In 1973, a major international climate event took place, the Stockholm Conference, which was the United Nations Conference on Human Environment that further galvanised the environment movement internationally.<sup>15</sup> The Stockholm Conference contained a section on the acceptance of pollutants which were of importance and the most important part of the declaration was that it raised the problem of climate change for the first time.<sup>16</sup> The US also participated among the 113 delegates, and its delegation comprised 63 members, including 28 technical advisers. President Nixon, in 1972, gave an Environment Message to Congress and

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13. EPA History, United States Environmental Protection Agency, Official Website, April 4, 2017. Available at <https://www.epa.gov/history>. Accessed on July 12, 2017.

14. About the Agency (2017), National Oceanic and Atmospheric Administration (NOAA), Official website. Available at <http://www.noaa.gov/about-our-agency>. Accessed on July 12, 2017.

15. The Rio Earth Summit (1992), Summary of the United Nations Conference. Available at <http://publications.gc.ca/Collection-R/LoPBdP/BP/bp317-e.htm#A>. History of the Summit(txt). Accessed on August 19, 2017.

16. "From Stockholm to Kyoto: A Brief History of Climate Change", *UN Chronicle*, June 2007. Available at <https://unchronicle.un.org/article/stockholm-kyoto-brief-history-climate-change>. Accessed on August 19, 2017.

**The first-ever treaty to save the stratospheric ozone layer by discontinuing the fabrication and utilisation of Ozone-Depleting Substances (ODS) was signed – known as the Montreal Protocol. It was a global agreement and the first treaty in the United Nations to get universal consensus: it was signed by 197 countries.**

introduced a voluntary Environment Fund which supported the movements of the UN Secretariat. The US willingly contributed to the fund on a suitable basis with the other nations by paying 40 percent of a five-year amount of \$100 million. The US also recommended a plan, which was approved by the Conference by the Earthwatch Programme to increase the working monitoring systems, so that pollution could be calculated around the world. The Stockholm Conference or the First Earth Summit created awareness about the need of protecting the planet globally which led

to similar international conferences in the 1980s. The US took a leading role in putting forward its proposals for tackling climate change. The aim was basically to warn the governments of all the countries about the effects of climate change. Another major international event which took place during President Reagan's Administration was the Montreal Protocol which was influenced by the Earth Summit.

#### *The Montreal Protocol (Another Milestone)*

Subsequently, by 1987, the first-ever treaty to save the stratospheric ozone layer by discontinuing the fabrication and utilisation of Ozone-Depleting Substances (ODS) was signed – known as the Montreal Protocol.<sup>17</sup> It was a global agreement and the first treaty in the United Nations to get universal consensus: it was signed by 197 countries. The Montreal Protocol was important because the Earth's ozone layer (which absorbs the sun's ultraviolet radiation) was getting depleted due to the greenhouse gases. This became a matter of concern for the world as the depletion would lead

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17. The Montreal Protocol on Substances that Deplete the Ozone Layer, U.S. Department of State, Official Website. Available at <https://www.state.gov/e/oes/eqt/chemicalpollution/83007.htm>. Accessed on July 18, 2107.

to life-threatening diseases. The United States signed the Protocol in 1987 and the EPA contributed by creating innovations and successful approaches to save the ozone layer.<sup>18</sup> President Reagan ratified on the Montreal Protocol in 1987 by stating: "In this historic agreement, the international community undertakes cooperative measures to protect a vital global resource. The United States played a leading role in the negotiation of the Protocol. United States ratification is necessary for entry into force and effective implementation of the Protocol. Early ratification by the United States will encourage similar action by other nations whose participation is also essential."<sup>19</sup>

**The Clinton-Gore Administration encouraged new environmentally friendly technologies and implemented strict environmental policies. President Clinton gave attention to climate change issues which resulted in many developments such as the Climate Change Technology Initiative and National Environmental Technology Strategy.**

#### **CLIMATE CHANGE ERA: 1993-95**

##### *The American 103rd Congress*

By the late 1970s and 1980s, the issue of climate change had entered the presidential campaign. In the year 1976, Al Gore held the first congressional hearings on climate change while running for the House of Representatives and talked about global warming. Al Gore, who became the vice president, later on, wrote a book on environmental conservation in 1988. Bill Clinton chose Al Gore for the presidential campaign in 1992 and in the year 1993, Gore's book, *Earth in the Balance: Ecology and the Human Spirit* was published. The Democratic President, Bill Clinton came into office with the thinking

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18. Ibid.

19. "Transmittal to the Senate of the Montreal Protocol on Substances that Deplete Ozone Layer", Action Memorandum, November 18, 1987. Available at <http://nsarchive.gwu.edu/NSAEBB/NSAEBB536-Reagan-Bush-Recognized-Need-for-US-Leadership-on-Climate-Change-in-1980s/documents/Document%207.pdf>. Accessed on July 19, 2017.

that the environment and economy go together. Vice-President Al Gore pushed President Clinton to implement the carbon tax and decrease fossil fuel consumption, which was partially implemented.<sup>20</sup> The Clinton-Gore Administration encouraged new environmentally friendly technologies and implemented strict environmental policies. President Clinton gave attention to climate change issues which resulted in many developments such as the Climate Change Technology Initiative and National Environmental Technology Strategy. The Clinton-Gore Administration increased the implementation of environmental laws.<sup>21</sup> However, Al Gore came in for a lot of criticism for his non-scientific statements on climate change. Many critics argued that he was a politician rather than a climate scientist.<sup>22</sup> The Clinton Administration was also involved in the negotiations regarding the Kyoto Protocol, yet climate change was not a domestic priority<sup>23</sup> as the Republicans dominated the Congress for twelve years which was a significant setback for the environmental policy in the Democrat Administration.<sup>24</sup>

### *The Republicans and the Kyoto Protocol*

As mentioned earlier, the political deadlock during the Clinton Administration created various problems for President Bush. In the subsequent years, the Administration of President Bush considered climate change as a low priority; various Acts such as the Clean Air Act, Clean Water Act, ESA and forest management laws were a concern for the Congressional Conservatives (a congressional group comprising conservative and liberal Republicans). President Bush chose a plain

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20. Jessica Aldred and Lauren Goodchild, "Timeline: Al Gore", *The Guardian*, 2017. Available at <https://www.theguardian.com/environment/2007/oct/12/climatechange1>. Accessed on August 19, 2017.

21. "The Clinton-Gore Administration: A Record of Progress", The White House. Available at <https://clintonwhitehouse5.archives.gov/WH/Accomplishments/eightyears-08.html>. Accessed on July 24, 2017.

22. "Is Al Gore's Inconvenient Truth Accurate?" (2017) *Skeptical Science*. Available at <https://www.skepticalscience.com/al-gore-inconvenient-truth-errors-intermediate.htm>. Accessed on August 19, 2017.

23. Emilio Cerdá and Xavier Labandeira, *Climate Change Policies: Global Challenges and Future Prospectus* (Cheltenham Glos: Edward Elgar Publishing Limited, 2010), p.268.

24. Klyza and Sousa, n. 11, p.71.

track by increasing the total budgets for pollution check and natural resources. The funding in environmental programme areas was reduced to the 2002 levels as the Republican-dominated Congress made little legislative progress on major issues of climate change.<sup>25</sup> The Republican Congress made some legislative implementations on major environmental problems. The most important climate change policies during the Bush Administration were the revisions to the Clean Air Act; he called the Act the "Clear Skies." The Clear Skies initiated 'cap-and-trade' which was a powerful solution for curbing the greenhouse gases in the atmosphere. The cap was supposed to curb the pollution and industries were to be penalised if they crossed the limit. The trade pact was market-based for the industries to sell and buy shares which allowed them to emit only a specific amount of greenhouse gases.<sup>26</sup> The other side of the climate change policy, during the Bush Administration, was the rejection of the Kyoto Protocol, the international treaty that extends the United Nations Convention on Climate Change (UNCCC).<sup>27</sup> President Bush wrote a letter to the US Senate in 2001 on the Kyoto Protocol: "I oppose the Kyoto Protocol because it exempts 80 percent of the world, including major population centers such as China and India, from compliance, and would cause serious harm to the US economy. I support a comprehensive and balanced national energy policy that takes into account the importance of improving air quality."<sup>28</sup> President Bush believed that a well maintained domestic energy policy could tackle climate change by curbing greenhouse gases. President Bush's climate change policies were influenced by his party's mainly ideological priorities concerning the responsibility of the private sector and government laws.<sup>29</sup>

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25. Ibid., p. 102.

26. Ibid., p. 103.

27. Kyoto Protocol (2014) United Nations Framework on Climate Change. Available at [http://unfccc.int/kyoto\\_protocol/items/2830.php](http://unfccc.int/kyoto_protocol/items/2830.php). Accessed on August 19, 2017.

28. Letters to Members of the Senate on the Kyoto Protocol on Climate Change- 444, (2001) US Government Publishing Office, March 13, 2001. Available at <https://www.gpo.gov/fdsys/pkg/WCPD-2001-03-19/pdf/WCPD-2001-03-19-Pg444-2.pdf>. Accessed on July 25, 2017.

29. Graham Pugh, "Clean Energy Diplomacy from Bush to Obama", *Issues In Science and Technology*, 2017. Available at <http://issues.org/31-3/clean-energy-diplomacy-from-bush-to-obama/>. Accessed on July 25, 2017.

**President Obama aimed at the economic transformation of the country by not depending on imports of oil from West Asia, instead, generating energy from renewable resources such as solar and wind in a sustainable manner.**

### **TACKLING CLIMATE CHANGE IN THE OBAMA GOVERNANCE**

The election of Barack Obama as President in November 2008 brought many changes. Tackling climate change was one of the important promises made by him during his presidential campaign. President Obama aimed at the economic transformation of the country by not depending on imports of oil from West Asia, instead, generating energy from renewable resources such as solar and wind in a sustainable manner.<sup>30</sup> His Administration enhanced the new

EPA to permit the states to adopt new automobile standards: by allowing California's refusal under the Clean Air Act, the EPA also coordinated the new federal levels with the California plan, which consisted of stricter laws on automobile air pollution than the federal laws and, thus, made the state rules the new law of the land. In 2009, President Obama pledged that by 2020, America would decrease its greenhouse gases, if all the other countries decreased their emissions as well.<sup>31</sup> On December 7, 2009, nations gathered in Copenhagen to decide on a post-Kyoto climate era, where the EPA made clear that GHGs were harmful to human life and welfare—which was an important way for curbing emissions under the Clean Air Act rules. The EPA's advancement gave a boost to President Obama in the Copenhagen negotiations. The American 111th Congress pressed on with a climate and energy approach which led to the introduction of the climate and energy Bill, which was known as the American Clean Energy and Security Act of 2009 (HR2154).<sup>32</sup> The reason behind the introduction of the Bill was to make environmental laws more strict and to curb carbon emissions from industries in a more effective way.

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30. Cerdá and Labandeira, n. 23, p. 269.

31. The President's Climate Action Plan: Executive Office of the President (2013) The White House Washington, June 2013. Available at <https://obamawhitehouse.archives.gov/sites/default/files/image/president27sclimateactionplan.pdf>. Accessed on July 26, 2017.

32. Cerdá and Labandeira, n. 23, p. 270.

***H.R. 2454: The Climate Bill***

The House Representatives Henry Waxman and Ed Markey introduced the Bill – HR 2454, the main feature of which was the *cap-and-trade* programme; apart from the programme, the law also had standards for spreading use of renewable energy, and efficiency.<sup>33</sup> The Bill contained many sections regarding: clean energy, clean transportation, smart grid advancement, nuclear and advanced technologies, reducing global warming pollution, and so on and so forth.<sup>34</sup> The third section of the Bill required the EPA administrator to inform the Congress annually on the status of adoption of GHG emissions standards by India and China.

***Climate Action Plan***<sup>35</sup>

President Obama's promise in 2009 to reduce GHG emissions by 2020, paved the way for more climate change actions on the US' part. President Obama introduced the Climate Action Plan to prevent carbon pollution which would further help in business transformation to remodel the power plants, reducing oil imports, which would help in the creation of more jobs and American-made energy. The plan had three main factors:

- **Cut Carbon Pollution in America:** By 2009, the US was going through a huge issue of carbon emissions and the use of renewable energy became one of the goals. This feature mainly focussed on clean energy in all forms. The carbon reduction from the power plants was the most important task as power plants comprised the largest source of carbon emissions in the US. The aim was to concentrate only on alternative energy and to encourage local governments and state governments to take a lead in the use of alternative energy. President Obama also issued a Presidential Memorandum and instructed the EPA to monitor and regulate the carbon pollution standards of the power plants. Another focus area in cutting carbon was *expanding and modernising the electric grid* whereby electricity would become more dependable, with a reduction

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33. Ibid., p. 270.

34. H.R. 2454- American Clean Energy and Security Act of 2009, Congress, June 26, 2009. Available at <https://www.congress.gov/bill/111th-congress/house-bill/2454>. Accessed on July 28, 2017.

35. n.31.



**The Obama Administration took international initiatives also, along with the domestic policies, as it was important to spread awareness internationally—this included bilateral negotiations with India and China.**

in the people's energy bills. The transportation sector was also an important area wherein heavy-duty automobiles were producing GHGs: in response to this, President Obama in 2011 decided to increase the Fuel Economy Standard for the years 2014-18. The curbing of emissions of Hydrofluorocarbons (HFCs) was another major issue as the emissions of HFCs were expected to triple by 2030. By reducing the emission rate of HFCs, America would take the lead in the international negotiations and the domestic affairs as well. The plan to reduce

carbon pollution also included the role of forests in mitigating climate change. America's forest cover plays an important role in tackling climate change by erasing 12 percent of America's GHGs.

- **Prepare the United States for the Impacts of Climate Change:** This factor was included because the impacts of climate change were leading to several other issues such as displacement of people and destruction of property; in this case, disaster management became necessary. The Obama government created an Interagency Climate Change Adaptation Task Force in 2009. In 2010, the Task Force arranged the first National Climate Adaptation Summit, gathering stakeholders from the regional and local levels. The federal agencies came out with a Climate Change Adaptation Plan in 2013, for protection from the effects of climate change. The Department of Homeland Security analysed the impacts on the Arctic region and the national borders of America. Another interesting method for climate change awareness was the creation of a toolkit for climate resilience which provided an easy approach to monitor the rising sea level and detect storms.
- **Lead International Efforts to Global Climate Change:** The Obama Administration took international initiatives also along with the domestic policies, as it was important to spread awareness internationally—this included bilateral negotiations with India and China. The US-India Partnership to Advance Clean Energy (PACE) focussed on low carbons

by giving support to research and clean energy. It further aimed at developing clean energy innovations through private-public cooperation. The US-China Clean Energy Research Centre (CERC) aimed at increasing research and development of clean energy technologies. It included engagement with scientists and engineers from the best universities and institutions. The Strategic Energy Dialogue with Brazil was another bilateral climate initiative. Another area of focus comprised the mobilising of climate finance. The climate finance was one of the important sectors in the international initiative to cut carbon emissions. The commitment of the US, with other developed countries, along with the Copenhagen Accord, provided \$30 billion as assistance to the developing countries from 2010 to 2012. In 2011, at the climate meeting in Durban, the nations agreed on negotiating a new climate agreement by the end of 2015.

**The plan was to cut carbon emissions by 30 percent from the 2005 levels as the power plants in US emit one-third of all GHGs. The plan also focussed on reducing pollution leading to smog and soot by 25 percent by the year 2030.**

### *Clean Power Plan*

On June 2, 2014, the Obama government, along with the EPA, proposed a national plan to cut carbon emissions from the coal-fired power plants which are the major contributors to climate change. The plan aimed at power plants in 47 states. But Hawaii, Vermont, and Alaska, which do not have power plants, were also under the regulation. The plan was to cut carbon emissions by 30 percent from the 2005 levels as the power plants in the US emit one-third of all GHGs. The plan also focussed on reducing pollution leading to smog and soot by 25 percent by the year 2030. The Clean Power Plan also created health benefits, circumventing premature deaths and asthma attacks in children. It allowed states flexibility in selecting how to achieve their goals.<sup>36</sup>

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36. "Overview of the Clean Power Plan: Cutting Carbon Pollution from Power Plants (2014)", EPA Fact Sheet: Clean Power Plan, June 2, 2014. Available at <https://www.epa.gov/sites/production/files/2014-05/documents/20140602fs-overview.pdf>. Accessed on July 29, 2017.

### *The Moratorium on Federal Coal Leasing*

President Obama introduced another initiative to curb climate change during his tenure, apart from his two plans. The Interior Department of the United States came up with reforms for the federal coal programme. This step was taken by the president to handle the fossil fuel issue and aim for a clean energy economy. The Programmatic Environmental Impact Statement (PEIS) was formed to take care of issues of where, how and when to lease; how to report for the public health; and environmental impacts of federal coal production. The Interior Department also came up with good governance reforms to enhance the transparency in the federal coal programme. The reforms also established a transparent database for the people for monitoring the carbon emissions from fossil fuels created on public lands, which required the Bureau of Land Management offices to post online the issues of coal leasing and the steps being taken to capture waste mine methane.<sup>37</sup>

### *Climate Change: A Threat to National Security*

According to President Obama, climate change was leading to climate insecurity encompassing food security, extreme weather conditions, and resource scarcity. His Administration established a Climate National Security Working Group in 2016, which directed the federal sections to implement specific functions which included climate change impacts on the development of national security, plans and policies. The memorandum also stated that federal support was necessary for the non-federal civil authorities and the US military as climate change was affecting the military operations, facilities and training.<sup>38</sup>

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37. "Secretary Jewell Launches Comprehensive Review of Federal Coal Program", US Department of the Interior, May 10, 2017. Available at <https://www.doi.gov/pressreleases/secretary-jewell-launches-comprehensive-review-federal-coal-program>. Accessed on July 29, 2017.

38. Presidential Memorandum – Climate Change and National Security (2016), The White House: President Barack Obama, September 21, 2016. Available on <https://obamawhitehouse.archives.gov/the-press-office/2016/09/21/presidential-memorandum-climate-change-and-national-security>. Accessed on July 29, 2017.

*The Arctic Model*<sup>39</sup>

On March 10, 2016, President Obama and Canadian Prime Minister Justin Trudeau released a joint statement on tackling climate change in the Arctic region. The Arctic region plays an important role in the world's climate, and climate changes in the Arctic such as melting of ice due to GHGs and rise of sea levels would lead to destruction of ecosystems and also affect the local communities. The Arctic leadership had four main objectives:

- **Conserving Arctic Biodiversity through Science-Based Decision-Making:** The US and Canada declared their national goals of saving the land and the marine areas by 2020. The two leaders also stated that conservation goals would be established for climate science and a pan-Arctic marine protection area network was also proposed.
- **Incorporating Indigenous Science and Traditional Knowledge into Decision-Making:** Canada and the US showed their dedication towards cooperating with the Arctic governments and communities so that traditional knowledge could be included in the decision-making. This would help in understanding climate change better.
- **Building a Sustainable Arctic Economy:** Commercial activities such as fishing, shipping, and gas and oil inspection were to be based on scientific affirmation. The commercial activities would take place only after going through environmental and safety measures which included indigenous rights as well. The leaders also focussed on the low impact shipping corridors, abundant Arctic fish, and a science-based approach to oil and gas.
- **Supporting Strong Arctic Communities:** This approach was taken to reinforce the indigenous people and to respect their rights. The other challenges such as education, mental wellness, and indigenous language

**The Arctic region plays an important role in the world's climate, and climate changes in the Arctic such as melting of ice due to GHGs and rise of sea levels would lead to destruction of ecosystems and also affect the local communities.**

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39. Joint Statement: U.S. Canada on Climate, Energy, and Arctic Leadership (2016) The White House: Office of the Press Secretary, March 10, 2017. Available at <https://obamawhitehouse.archives.gov/the-press-office/2016/03/10/us-canada-joint-statement-climate-energy-and-arctic-leadership>. Accessed on July 30, 2017.

were also addressed. The leaders also pledged to engage in a bilateral dialogue on scientific research through the Arctic Council.

- President Obama also banned offshore oil drilling in the Arctic and Atlantic Oceans as this releases methane and hydrocarbons which comprise the GHGs leading to climate change.<sup>40</sup>

### *The US Enters the Paris Agreement*

Another major landmark in the climate history was the Paris Agreement which entered into force on November 4, 2016. The United States ratified the Paris Agreement on April 22, 2016, The president made a Joint Presidential Statement with Chinese President Xi Jinping as China is one of the growing economies, thereby defining the implementation for post-2020 emissions of both countries.<sup>41</sup> President Obama remarked on the Paris Agreement: "...the investments that we made to allow for incredible innovation in clean energy and the strong, principled diplomacy over the course of years that we were able to see pay off in the Paris Agreement. The United States and China were central to that effort. Over the past few years, our joint leadership on climate has been one of the most significant drivers of global action."<sup>42</sup> President Obama also instituted 'Mission Innovation', which showed dedication to work for climate change by allocating funding which was around \$30 billion for five years for Research and Development (R&D) in clean energy. The Obama Administration promised \$3 billion to help the Green Climate Fund (GCF), which was one of the important features of the Paris Agreement to reduce carbon emissions and strengthen the developing countries, specifically the poorest nations.<sup>43</sup>

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40. Fact Sheet: President Obama Protects 125 Million Acres of the Arctic Ocean (2016), The White House: Office of the Press Secretary. Available at [https://www.doi.gov/sites/doi.gov/files/uploads/2016\\_arctic\\_withdrawal\\_fact\\_sheet\\_for\\_release.pdf](https://www.doi.gov/sites/doi.gov/files/uploads/2016_arctic_withdrawal_fact_sheet_for_release.pdf). Accessed on August 22, 2017.

41. White House, U.S. Department of the Interior, *U.S. Climate Policy: Change of Power – Change of Heart – New Presidential Order vs. Laws & Actions of the Former President, A Review of the New Presidential Orders as Opposed to the Legacy of the Former President* (Madison and Adams Press, 2017), p. 9.

42. Tanya Somanader, "President Obama: The United States Formally Enters the Paris Agreement", The White House: President Barack Obama, April 22, 2016. Available at <https://obamawhitehouse.archives.gov/blog/2016/09/03/president-obama-united-states-formally-enters-paris-agreement>. Accessed on July 30, 2017.

43. n. 41, p. 9.

The climate change legacies of the Obama Administration show how important climate change was for the president and how he implemented the policies to curb carbon pollution from all dimensions. The Obama governance ended on January 20, 2017, which led to the rise of the Republicans, and Donald J Trump became the 45th president of the US. President Trump reversed the climate policies of President Obama and established new policies which have been criticised in the US and by other world leaders as well.

**The Obama governance ended on January 20, 2017, which led to the rise of the Republicans, and Donald J Trump became the 45th president of the US. President Trump reversed the climate policies of President Obama and established new policies which have been criticised in the US and by other world leaders as well.**

## **PRESIDENT TRUMP'S STATEMENTS ON CLIMATE CHANGE**

### *Pre-Presidential Campaign*

In the year 2009, Trump signed a full-page advertisement in the *New York Times*, asking President Obama to act on climate change.<sup>44</sup> The open letter stated: "As business leaders, we are optimistic that President Obama is attending Copenhagen with emissions targets. We support your effort to ensure meaningful and effective measures to control climate change, an immediate challenge facing the United States and the world today. If we fail to act now, it is scientifically irrefutable that there will be catastrophic and irreversible consequences for humanity and our planet."<sup>45</sup> This letter of President Trump contradicts the present climate policy reversals.

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44. Madeleine Sheehan Perkins and Rebecca Harrington, "President Trump Doesn't Believe in Climate Change: Here's What He's Said About It in the Past", *Business Insider*, June 2, 2017. Available at <http://www.businessinsider.in/president-trump-doesnt-believe-in-climate-change-heres-what-hes-said-about-it-in-the-past/articleshow/58953357.cms>. Accessed on August 1, 2017.

45. Ben Adler and Rebecca Leber, "Donald Trump Once Backed Urgent Climate Action. Wait, What?" *Grist*, American non-profit online magazine, June 8, 2017. Available at <http://grist.org/politics/donald-trump-climate-action-new-york-times/>. Accessed on August 1, 2017.

**President Trump may have had an open mind for addressing climate change in the year 2016, though during the presidential campaign he promised to cancel payments to UN climate funds, claiming that the money would be used to fix the domestic issues of water and the environment.**

By 2010, President Trump had changed his stance, instead criticising Al Gore for cleaning up the plants and factories to protect people from global warming, but also criticising China for not paying attention to global warming.<sup>46</sup> Another instance, when President Trump addressed global warming was when the Trump International Golf Links and hotels in Ireland were affected by coastal erosion. The company was permitted to construct a seawall (prevent the sea from advancing on to the land) to safeguard the property from “global warming”.<sup>47</sup> This case was also one of contradiction, as President Trump did not

believe in global warming but was willing to protect his property from its effects. President Trump has connected the climate change issue to China several times.<sup>48</sup>

### *During Presidential Campaign*

In 2016, President Trump signalled, “There is still much that needs to be investigated in the field of climate change. Perhaps the best use of our limited financial resources should be in dealing with making sure that every person in the world has clean water. Perhaps we should be focused on developing energy sources and power production that alleviate the need for dependence on fossil fuels.”<sup>49</sup> President Trump may have had an open mind for addressing climate change in the year 2016, though during the

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46. Jeremy Schulman, “A Timeline of Every Ridiculous Thing Trump Has Said About Climate Change,” *Newsweek*, April 2, 2017. Available at <http://www.newsweek.com/timeline-every-ridiculous-thing-trump-has-said-about-climate-change-576238?amp=1>. Accessed on August 1, 2017.

47. Ben Schreckinger, “Trump Acknowledges Climate Change—At His Golf Course”, *Politico*, May 23, 2016. Available at <http://www.politico.com/story/2016/05/donald-trump-climate-change-golf-course-223436>, Accessed on August 1, 2017.

48. Sheehan Perkins and Harrington, n. 44.

49. 2016 Presidential Q&A (2017) Science Debate. Available at <https://www.sciencedebate.org/2016-answers-release>. Accessed on August 1, 2017.

presidential campaign he promised to cancel payments to UN climate funds, claiming that the money would be used to fix the domestic issues of water and the environment. He also promised to lift the restrictions on American energy reserves such as natural gas, clean coal, and oil.<sup>50</sup>

### *During the Presidency*

#### *Reversal of Obama's Clean Power Plan Reversal<sup>51</sup>*

The first climate policy which has been reversed in the Trump era is the Clean Power Plan. According to President Trump, the past climate policy had burdened the Americans with an expensive law that was affecting energy production and American jobs. The Clean Power Plan went up to \$39 billion a year and electricity prices increased in 41 states by 10 percent in the Obama era. The present Administration claims that the plan would decrease coal production by 242 million tons, as stated by the National Mining Association. President Trump made clear that: "27 states, 24 trade associations, 37 rural electric co-ops, and 3 labor unions are challenging the Clean Power Plan in Federal Courts." The Trump Administration's Executive Order instructed the EPA to "suspend, revise, or rescind" the Clean Power Plan. President Trump also instructed the attorney general to request for relief from the courts "over pending litigation" over the Clean Power Plan. The Executive Order also asked the agencies to go through plans that stress on energy production and "suspend, revise or rescind actions that are not mandated by law." President Trump has signed

**The main aim of reversing the Clean Power Plan was to bring coal mining jobs back to America and introduce more fossil fuel industries, as the Clean Power Plan had increased the use of alternatives such as natural gas rather than coal.**

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50. "Seven Actions to Protect American Workers: Donald Trump's Contract with the American Voter" (2016). Available at [https://assets.donaldjtrump.com/\\_landings/contract/O-TRU-102316-Contractv02.pdf](https://assets.donaldjtrump.com/_landings/contract/O-TRU-102316-Contractv02.pdf). Accessed on August 19, 2017.

51. President Trump's Energy Independence Policy (2017), The White House: Office of the Press Secretary, March 28, 2017. Available at <https://www.whitehouse.gov/the-press-office/2017/03/28/president-trumps-energy-independence-policy>. Accessed on August 2, 2017.



**The Arctic policies of the current president are unclear, though one of the Executive Orders of President Trump has removed the Obama-era idea which was given by Alaska's native villagers: it focussed on safeguarding the Bering Sea marine life and helping people cope with extreme weather conditions there.**

four sections of legislation to remove the pressure from the expensive energy production from the past Administration and also created a "Regulatory Reform Task Force" to understand the expensive rules for modification. The main aim of reversing the Clean Power Plan was to bring coal mining jobs back to America and introduce more fossil fuel industries, as the Clean Power Plan had increased the use of alternatives such as natural gas rather than coal.

*Climate Change Not a Threat to National*

*Security*

The current US president's "*Energy Independence*" Executive Order reverses the memorandum of the past president. President Trump believes that climate change does not affect the national security, and that extreme weather conditions such as droughts, hurricanes, and rising sea level are no threat to the national security. Section 3 of the "*Energy Independence*" Executive Order: "Recession of Certain Energy and Climate-Related Presidential and Regulatory Actions" revokes the "Presidential Memorandum of September 21, 2016 (Climate Change and National Security)."52

*The Arctic Climate Policy in the Trump Era*

The Arctic policies of the current president are unclear, though one of the Executive Orders of President Trump has removed the Obama-era idea which was given by Alaska's native villagers: it focussed on safeguarding the Bering Sea marine life and helping people cope with extreme weather

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52. Presidential Executive Order on Promoting Energy Independence and Economic Growth (2017) The White House: Office of the Press Secretary, March 28, 2017. Available at <https://www.whitehouse.gov/the-press-office/2017/03/28/presidential-executive-order-promoting-energy-independence-and-economy-1>. Accessed on August 3, 2017.

conditions there.<sup>53</sup> The local governments might come up with new Arctic roles—a declaration by the mayors of the cities of Canada, Alaska, Finland, Norway and Iceland has promised to “expand economic diversification, opportunity and local benefits, build cutting edge infrastructure, assume responsibility and provide leadership in our adaptation to a changing climate, govern using the best available science, knowledge and technology and promote healthy equitable communities through inclusion and cooperation.”<sup>54</sup> President Trump also issued an Executive Order on the “*First Offshore Energy Strategy*” which reversed the former president’s Arctic leasing ban: “This executive order starts the process of opening offshore areas to job-creating energy exploration.”<sup>55</sup>

**On the international level, President Trump withdrew from the Paris Accord which the Obama Administration had accepted. For President Trump, this agreement was not important and he claimed that it was damaging the US economy due to the climate funds.**

#### *Withdrawal from the Paris Agreement*

On the international level, President Trump withdrew from the Paris Accord which the Obama Administration had accepted. For President Trump, this agreement was not important and he claimed that it was damaging the US economy due to the climate funds. President Trump gave a statement on the Paris Accord: “The United States will withdraw from the Paris Climate Accord, but begin negotiations to reenter either the Paris Accord or a really entirely new transaction on terms that are fair to the United States, its businesses, its workers, its people, its taxpayers. So we’re getting out. But

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53. Yereth Rosen, “With Trump Administration Intentions Unclear, Alaskans Might Have to Fill the Void on Arctic Policy”, *Alaska Dispatch News*, May 22, 2017. Available at <https://www.adn.com/arctic/2017/05/21/with-trump-administration-intentions-unclear-alaskans-might-have-to-fill-the-void-on-arctic-policy/>. Accessed on August 3, 2017.

54. “Declaration of Arctic Mayors (2017)”, Institute of the North. Available at [http://www.institutenorth.org/assets/images/uploads/files/Arctic\\_Mayors\\_Declaration.pdf](http://www.institutenorth.org/assets/images/uploads/files/Arctic_Mayors_Declaration.pdf). Accessed on August 3, 2017.

55. Remarks by President Trump at Signing of Executive Order on an America- First Offshore Energy Strategy (2017), The White Office: Office of the Press Secretary, April 28, 2017. Available at <https://www.whitehouse.gov/the-press-office/2017/04/28/remarks-president-trump-signing-executive-order-america-first-offshore>. Accessed on August 7, 2017.

**The reversal of the Clean Power Plan which was one of the most important policies of President Obama, accelerated the legal process by the states and local governments.**

we will start to negotiate, and we will see if we can make a deal that's fair. And if we can, that's great. And if we can't, that's fine. This includes ending the implementation of the nationally determined contribution and, very importantly, the Green Climate Fund which is costing the United States a vast fortune."<sup>56</sup> The exit from the Paris Agreement and reversal of Obama's policies have opened the door for criticism from various fields.

### *Opposition Building in US Congress against Trump's Reversal*

As President Trump reversed the climate legacy of the former president, the US Congress deliberated upon some legislative actions on his orders on coal, oil and gas, to challenge this reversal.<sup>57</sup> A top EPA official resigned from the EPA as President Trump's reversals showed lack of interest in the climate change issue for which the EPA had made strict laws in the past. In the Trump Administration, the EPA has displayed a weakened stance on environmental laws. The EPA official stated: "It may take a few years and even an environmental disaster, but I am confident that Congress and the courts will eventually restore all the environmental protections repealed by this Administration because the majority of the American people recognize that this protection of public health and safety is right and it is just."<sup>58</sup> Apart from legal actions, public protests have gained momentum against the reversals of President Trump. Both the people and the states in the US, took an independent stand on climate

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56. Statement by President Trump on the Climate Accord (2017) The White House: Office of the Secretary, June 1, 2017. Available at <https://www.whitehouse.gov/the-press-office/2017/06/01/statement-president-trump-paris-climate-accord>. Accessed on August 4, 2017.

57. Marianne Lavelle, "How Congress Is Cementing Trump's Anti-Climate Orders into Law", *Inside Climate News*, July 31, 2017, *Lost Light Projects Inc.US*. Available at <https://insideclimatenews.org/news/31072017/trump-climate-change-executive-orders-congress-turning-into-law-via-budget>. Accessed on August 5, 2017.

58. Betsy Farwell Message, "PEER: Protecting Employees Who Protect Our Environment", August 1, 2017. Available on [https://www.peer.org/assets/docs/epa/8\\_1\\_17\\_Betsy\\_farewell\\_message.pdf](https://www.peer.org/assets/docs/epa/8_1_17_Betsy_farewell_message.pdf). Accessed on August 5, 2017.

change after the policy reversals. The reversal of the Clean Power Plan which was one of the most important policies of President Obama, accelerated the legal process by the states and local governments. The states and local governments of the US wrote a letter to Vice-President-Elect Pence stating: "We joined in EPA's defense of the Clean Power Plan in court mindful of the grave threats that carbon pollution poses to our residents, economies, infrastructure, and natural resources."<sup>59</sup> All these cases show how Trump's reversals are affecting the people, states and local bodies in the US. The other issue in the climate movement comprises the lobbying against the climate regulations by the firms or industries which will be affected by the tough regulations. The US Chamber of Commerce, which is America's largest lobbying organisation, spent \$90 million on climate legislation in 2014. Lobbying is conducted not only by the firms but also by those who want to bring changes in the system if it turns rigid.<sup>60</sup> Lastly, the exit from the Paris Agreement saw many protests from many environmental organisations such as Greenpeace. Greenpeace stated: "Trump's isolationist stance at a critical moment in history is morally reprehensible, but his attempt to derail the global progress on climate change will fail. The Paris Agreement will remain in force, with or without the US government, and transition to clean energy will continue."<sup>61</sup> The Paris Agreement clearly shows that US presidents, both former and current, have acted according to their own choice about the agreement, without the approval of Congress. Article II Section 2 of the American Constitution demands two-thirds majority of the Senate. When presidents act without the consent of Congress, the

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59. Final Letter, Scribd, December 28, 2016. Available at [https://www.scribd.com/document/335302186/20161228-Final-Letter#fullscreen&from\\_embed](https://www.scribd.com/document/335302186/20161228-Final-Letter#fullscreen&from_embed). Accessed on August 6, 2017.

60. Magali Delmas, "Research: Who's Lobbying Congress on Climate Change", *Harvard Business Review*, October 27, 2016. Available at <https://hbr.org/2016/10/research-whos-lobbying-congress-on-climate-change>. Accessed on August 6, 2017.

61. "Trump Announces U.S. 'Withdrawal' From Paris Climate Agreement - Greenpeace Response", (2017), Greenpeace, June 1, 2017. Available at <http://www.greenpeace.org/usa/news/trump-announces-u-s-withdrawal-from-paris-climate-agreement-greenpeace-response/>. Accessed on August 6, 2017.

**The reversal of the climate policies of the former president, which lasted for eight years, by President Trump, will have to cross the legal and political boundaries. Apart from these two dimensions, the people and the environmental organisations have been protesting and taking legal action against President Trump.**

orders themselves become vulnerable and can be reversed.<sup>62</sup>

## CONCLUSION

The timeline of the American climate policies gives a picture of different actors who helped in spreading awareness on climate change and its impacts. The Americans' environmentalism pushed the American presidents to implement laws that showed climate change as a threat not only to the US but to the world as well. The man-made greenhouse gases which are the most important emissions

and tough to reduce, became a matter of concern for the US. Laws such as the Clean Air Act passed by the EPA during President Nixon's time clearly gave a picture of tackling climate change from the roots. America's involvement with international agreements in the past, with a few exceptions such as President Bush's rejection of the Kyoto Protocol, brought out the importance of climate change. The American implementation of climate policies also threw light on the beliefs of the presidents regarding the phenomenon of climate change. President Obama's milestones on the issue showed how important it was for him. The initiatives which he took such as the Clean Power Plan and banning offshore drilling for oil in the Arctic were major counters for climate change as well as for America.

The reversal of the climate policies of the former president, which lasted for eight years, by President Trump, will have to cross the legal and political boundaries. Apart from these two dimensions, the people and the environmental organisations have been protesting and taking legal action against President Trump. The federal agencies such as the EPA might face

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62. Davis Davenport, "Climate Change Reversals Remind Us: We Live in a Roller Coaster Executive Order World", *Forbes*, June 2, 2017. Available at <https://www.forbes.com/sites/daviddavenport/2017/06/02/climate-change-reversal-reminds-us-we-live-in-a-roller-coaster-executive-order-world/#13bd28fe5bf2>. Accessed on August 6, 2017.

tough times though, due to the low funding and unpredictable leadership. On the international level, the US' withdrawal from the Paris Agreement has raised concerns worldwide. The absence of the US has left a gap in the expected carbon emissions standards. The question that arises here is: how will the US fill the gap? President Obama had set the reduction targets for 2025 between 26 and 28 percent below the 2005 levels. The European Union (EU) has responded to President Trump's withdrawal by stating that the EU would not make extra reductions in the carbon emissions and would not fill the gap which the US has left.<sup>63</sup>

The future of American climate policies lies in the states, local governments, civil society and corporate giants taking the lead. They will have to work on the carbon footprints. It will be a massive task for these actors to tackle the climate change issue as the US is the second highest emitter of greenhouse gases after China. Hurricanes such as Harvey and Irma reflect the impact of climate change. There is an urgent need for change in climate diplomacy so that extreme weather conditions may be brought under control.

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63. Daniel Boffey, "EU Says No Extra Emission Cuts to Fill the Gap Left by the US After Paris Withdrawal", *The Guardian*, June 6, 2017. Available at <https://www.theguardian.com/environment/2017/jun/06/european-leaders-scale-up-climate-change-efforts-trump-paris-deal>. Accessed on August 22, 2017.



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