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India Foundation Journal

Editorial Board

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India Foundation is an independent research centre focussed on the issues, challenges, and opportunities of the Indian polity. The Foundation believes in understanding contemporary India and its global context through the civilizational lens of a society on the forward move. Based on the principles of independence, objectivity and academic rigour, the Foundation aims at increasing awareness and advocating its views on issues of both national and international importance.

With a team of dedicated professionals based at its office in New Delhi, the Foundation works with partners and associates both in India and overseas to further its stated objectives.

About India Foundation Journal

The India Foundation Journal is led by an Editorial Board of eminent scholars and leaders from various spheres of Indian public life. The bi-monthly journal covers a wide range of issues pertinent to the national interest, mainly focusing on international relations, national security, legal and constitutional issues and other issues of social, religious and political significance. The journal seeks articles from scholars with the intent of creating a significant body of knowledge with a nationalist perspective and establish a recognised forum for debates involving academicians and policymakers.

The Viksit Bharat Challenge

Dhruv C Katoch*

In the first few decades after independence, the euphoria of freedom did not translate into the rapid economic growth that had been hoped for. There were, undeniably, serious governance challenges. Literacy levels were abysmally low, agricultural output was weak, the partition had caused significant economic disruption, especially in agriculture and trade, and inadequate infrastructure hindered growth and investment. However, all these issues could have been addressed within a decade or two. The fact that India continued to wallow in poverty four decades after independence points to fundamental policy failures and a lack of strategic vision.

A primary factor keeping India poor was an overreliance on state control based on the Soviet model. The overregulated economy and excessive permits and controls discouraged entrepreneurship and innovation. To bolster the socialist narrative, Indian cinema embraced themes that saw virtue in poverty and regarded wealth as a symbol of corruption. The entrepreneur was portrayed as the villain when, rightly, the focus should have been on India's bureaucracy and political class, which stifled growth to maintain its dominance in society. In most cinematic narratives, the entrepreneur was depicted as exploitative and greedy, while workers were shown as paragons of virtue. This, perhaps, appeased the sentiments of the masses but did little to elevate India out of poverty. This mindset may have been deliberately cultivated among the masses to encourage acceptance of their situation and discourage clamouring for a better, more dignified life.

The economic reforms of 1991, 44 years after independence, marked the first steps toward change. These reforms were not the result of a deliberate policy shift but were imposed on India as it faced a significant trade deficit and a critical shortage of foreign exchange, barely sufficient to cover 2 to 3 weeks of imports. A high fiscal deficit, unsustainable debt, and rampant inflation compelled the government to seek assistance from the IMF and World Bank for a bailout. The conditions stipulated for receiving funds included structural reforms to liberalise the economy and make it more market-oriented. This turned out to be a blessing in disguise. The Narasimha Rao era reforms led to the removal of many licensing and regulatory restrictions on the government's role in business and also opened the economy to foreign investment and trade.

In 1999, another significant change occurred with the coming in of the Atal Bihari Vajpayee-led NDA government. Under Vajpayee's leadership, India took a substantial step in envisioning a grander Bharat. This gave birth to the idea of connecting the four metro cities—Mumbai, Delhi, Kolkata, and Chennai with four-lane national highways and led to the inauguration of the gigantic

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Golden Quadrilateral project by the then Prime Minister, Shri Atal Bihari Vajpayee. A project of this scale had not been attempted earlier. It changed the face of Indian highways and set new benchmarks for a range of development projects.

The third significant change occurred when the Modi-led NDA government provided a long-term development vision for the country. The 'Viksit Bharat' goal is to make India a developed country by the country's 100th anniversary of independence in 2047. The Prime Minister set a growth target to achieve developed status, which translates to a USD 30 trillion economy by 2047.

This was a welcome change from the five-year plans based on the Soviet model. The plan is ambitious but achievable. However, every Indian will have to strive hard to achieve that outcome. As of now, India's economy is approximately USD 4.3 trillion. It is the world's fifth-largest economy, following the US (30.34 trillion), China (19.35 trillion), Germany (4.92 trillion), and Japan (4.39 trillion). India will soon surpass Japan and Germany to become the third-largest economy in the world. But while India's GDP is rising, the country remains poor, as indicated by its per capita GDP, which stands at USD 2.94 thousand.

The per capita GDP of the developed world is significantly higher, with the US, Germany, Japan, and China at USD 89.68 thousand, 57.91 thousand, 35.61 thousand, and 13.87 thousand, respectively. If India can achieve a GDP of USD 30 trillion by 2047 and maintain its population at the current level, it would have a per capita GDP of USD 20 thousand, become a middle-income country, and poverty would no longer afflict the nation.

While India's growth trajectory has been steady over the past decade, many challenges must be overcome to achieve the above target. These lie in different domains: Technology, demography, social cohesion, military preparedness, and governance.

Technology

Technology will be the key driver for India's growth story, especially in fields such as Generative AI, quantum computing, and chip manufacturing. We need Indian solutions to India's problems and not copy-paste efforts from what the West is doing. We need mother-tongue-based learning even at the university level. Innovations could include introducing large language models (LLMs) in phones that can translate speech and lectures instantly. This would revolutionise education and lead to a spurt in innovation and original thought, led by India's youth.

India does not need to reinvent the wheel to build foundational LLMS, as these are now more or less available as open-source material. Competing head-on with the US and China by creating a new foundational model is neither feasible nor desirable. The locus of competition has shifted to what can be built atop a freely available foundational model, and this is where India's focus area should lie. Indian Knowledge Systems (IKS) are unique, offer India-specific solutions, and come with intellectual property rights and core competence. This is where our focus area should lie. Build solutions for India to address India's unique problems. The Unified Payments Interface (UPI) for digital payments is an apt

example of using technology for Indian needs. To remain in the game, we need a really smart industrial policy that should include a) IPR law, b) data protection that prevents the siphoning off of sensitive indian medical, financial and genetic data, among others, c) identifying niche segments to focus on.

Demography

A large population is not an asset if vast millions are poor and semi-literate. There is a need to check population growth by incentivising small family norms. Population growth has not been even across states and across religious groups, which has the potential to create discord. Towards this end, the anticipated increase in parliamentary seats should not be based on a population census but should be carried out proportionately. Increasing the representation of each state by 50 per cent would ensure that those states that have done well in controlling their population are not penalised. Similarly, there should be a system of incentives and disincentives to promote small family norms. This will ensure social cohesion, assist in poverty alleviation and enable India to achieve its vision of a developed nation by 2047.

Social Cohesion

Since independence, the country has been riven with social strife on various issues—ethnic, communal, caste, farmers, etc. While protest is a legitimate function in any democracy, vandalising property or forcing the closure of roads and rail networks in pursuance of one's demands impinges on the rights and freedoms of others. A consensus must develop among all political parties to adhere to basic norms of protest. The courts, too, should be sensitised to these matters and desist from interfering with the executive. The government of the day is accountable to the people who have elected them, and the courts should desist from interfering in legislation passed by the respective state governments or the Centre.

Another aspect impinging on social cohesion is the influx of a large number of illegal Bangladeshi and Rohingya into India. As per some estimates, this number could be more than 20 million. We need to identify such individuals and deport them back to their own countries. India's precious resources cannot be diverted to causes other than the improvement of the lives of its citizens.

Military Preparedness

India's growth trajectory must also include the development of its military capability. This encompasses developing all border areas, including communication networks and infrastructure for military purposes, as well as the development of border villages. The communities living in these border areas must be empowered, as the local civilian population is the first line of defence. Initiatives taken in this regard over the last decade must continue until the infrastructure of the border areas matches what the Chinese have constructed on the opposite side. Alongside this, the defence manufacturing sector must be ramped up to further reduce India's import dependence. The private sector must play a significant role in defence manufacturing and be incentivised accordingly.

Governance

Finally, India's growth story is a function of its political will and administrative acumen. Politically, the country has great stability, which augurs well for economic growth. However, administrative and judicial reforms are needed. Administrative reforms are required to create a conducive climate for growth, and judicial reforms are required to ensure that justice is administered swiftly and fairly. This will encourage business and economic development.

India has made rapid strides in its development effort over the last decade. This is no mean achievement, and India is currently the fastest-growing large economy in the world. The target of Viksit Bharat by 2047 is achievable, but it would necessitate a concerted effort by all stakeholders. The government has a major role to play, but civil society must also get involved in the development effort to achieve the vision laid out.

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The Generative AI Boom: Options for India

Rajeev Srinivasan, Dr M Vidyasagar FRS, and Dr Abhishek Puri*

The massive excitement- some might call it hype- surrounding Generative AI, which began with the arrival of OpenAI's ChatGPT in late 2022, continues to unfold. There have been a few recent dips, first with the announcement of competition from China's Deepseek and then with the general decline of the NASDAQ and the Magnificent Seven tech companies, even prior to the tariff tantrums.

The market valuations remain enormous. OpenAI was valued at $300 billion in a funding round, while xAI (Elon Musk's company that has productised Grok using real-time data from X, (formerly Twitter) is valued at $80 billion.

On the other hand, there are questions about intellectual property: ChatGPT reproduced the trademark look and feel of the Japanese animation studio Ghibli, with no clarity regarding whether a license for the IPR was obtained. There is also a sinister outcome: the photographs you Ghibli-ize become the property of OpenAI.

There are three broad and interesting questions: first, whether we are witnessing a genuine, life-changing innovation as dramatic as the arrival of electricity; second, where the significant returns on investment will come from; and third, what India's current and future roles may entail, especially in light of the recent national AI mission announcements.

1. Is Generative AI a Truly Disruptive Innovation?

First, let's discuss the nomenclature. Traditional AI and Machine Learning are now referred to as predictive AI. This approach utilises vast amounts of numerical data to identify patterns. Significant advancements in recent years, such as AlphaFold, have originated from this field. It examines historical data to predict future outcomes or trends. Statistical models and machine learning algorithms predict events like customer behaviour, market trends, or equipment failures.

Generative AI, on the other hand, focuses on creating new content or data, such as images, text, music, or even software code. It is designed to produce novel outputs based on patterns learned from existing data, primarily unstructured data like text.

Predictive AI has yielded valuable results, enhancing everything from retail inventory planning to more precise X-ray interpretations. The challenge with generative AI is that it has yet to produce a compelling enterprise use case.

Currently, there is no clear use case for B2C Generative AI either. While generative AI is likely to soon become as common as email and video conferencing, few people would be willing to pay for these products. For the most part, major vendors are using generative AI to "enhance the user

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experience." Having accomplished this, they are quite willing to release their code to the public at large. There is a *potential* use case for software companies to assist enterprises in improving their internal processes with AI; these companies would function like consultants but with a tangible impact on operations.

There is a belief that AI-based "agents" might revolutionise workflows and enterprise computing. Similarly, the increasingly popular "vibe-coding" may enable non-technical users to generate software using simple English prompts. All of this remains to be seen, and despite enthusiastic announcements, a decisive use case is elusive. Therefore, at this moment, generative AI is not an earth-shaking innovation like electricity or the Internet.

2. What is Behind the Meteoric Rise of Generative AI?

Several factors have established the basis for its popularity. In addition to those mentioned below, there is the ongoing pursuit of an "economic moat," the development of a hype cycle as a regular aspect of the technology industry, and the use of "standards" as a competitive weapon.

Technical Breakthroughs that Enabled a Better User Interface

Since ChatGPT first appeared in late 2023, the rapid uptake of Generative AI was primarily attributed to its excellent user experience. Additionally, the AI generated responses to questions quickly and with impressive confidence, even though users knew these responses were statistical rather than deterministic and could be prone to errors (hallucinations).

The example of Eliza, an early AI chatbot from the 1960s, is instructive. Eliza functioned like a psychotherapist—rephrasing what the user said into questions or prompts to encourage further elaboration. This method created a surprisingly conversational experience despite its simplicity. People weren't merely interacting with a program—they were filling in the gaps with their humanity, making it feel personal and responsive.

Eliza also focused on the conversation, enhancing the illusion of a one-on-one exchange with a thoughtful listener. When its internal code did not allow it to generate a sensible answer, it simply responded with "Tell me more about …" (the last topic). It didn't inundate users with options or technical jargon—it just "listened" and responded, which felt intuitive and natural.

Much the same is true of today's chatbots, which give the (mistaken) impression that a profoundly empathetic person is at the other end of the conversation. This anthropomorphisation, unfortunately, has sometimes led to addictive behaviour, resulting in depression, mental illness, and even suicide.

Cinema thrives on viewers' "willing suspension of disbelief." Similarly, generative AI burst onto the scene with believable answers to common questions, and unsurprisingly, it became the technology with the fastest adoption rate ever.

The Gold Rush Paradox

During the 1849 Gold Rush, miners flocked to California, dreaming of striking it rich. Still, the reality was harsh—most barely broke even, while real wealth accumulated in the hands of intermediaries. These included merchants selling picks, shovels, pans, jeans, and provisions and those who built shanty towns and ran nightclubs. They

thrived because they provided the essential tools and infrastructure that every miner needed, regardless of whether those miners found gold. The demand was predictable and widespread, and intermediaries didn't bear the same risks as the prospectors digging for an uncertain payoff.

A similar dynamic is unfolding with generative AI today. Companies developing and selling enterprise AI solutions—such as those providing custom chatbots, content generators, or industry-specific AI platforms—are akin to the miners. They're pursuing the "gold" of widespread adoption and transformative use cases, but their success is far from assured. Developing AI models is expensive, competitive, and risky; it requires significant investment in talent, data, and computing power, and the payoff relies on market acceptance and differentiation in a crowded landscape.

In the meantime, chip makers like Nvidia and cloud computing giants such as Amazon (AWS), Microsoft (Azure), and Google (GCP) serve as modern intermediaries. Every AI company, from startups to tech titans, depends on these tools. For example, Nvidia's chips represent the gold standard for training large language models (LLMs). Similarly, cloud providers supply the storage, networking, and computing resources necessary to make AI development and deployment feasible at scale.

The intermediaries thrive because their products are essential, and their revenue streams are more stable. In contrast, enterprise AI companies confront intense competition and unpredictable margins. They are counting on providing value to end users, but they're frequently just one innovation or pricing battle away from being undercut. The intermediaries, with established positions and extensive customer bases, capture most of the value without facing the same risks. Just as Levi Strauss created a denim empire while many miners failed, Nvidia and the cloud giants earn billions while AI startups struggle for survival.

Microsoft's Strategic Vision, Reinvention, and Competitive Skills

Microsoft's strategic vision has been pivotal in expanding generative AI. By leveraging its partnership with OpenAI, it created an entirely new market. Consequently, Microsoft is the only company in the top 10 in market capitalisation in 2001 and 2025.

In the earlier era, it utilised its co-ownership of the dominant Wintel franchise to establish this position. Then, transitioning from desktop to cloud computing, it positioned itself among the top three cloud computing platforms, alongside Amazon's AWS (the pioneer) and Google Cloud (which lags far behind).

As discussed, cloud computing and chips represent the most lucrative aspects of the generative AI ecosystem. In a sense, this mirrors the re-creation of the Wintel duopoly. Microsoft has positioned itself advantageously by partnering with OpenAI and capitalising on enterprise customers who are already committed to Windows, Office, Teams, and other products.

There is also a fascinating saga of corporate competition, where Microsoft has turned the tables on Google in their decades-long rivalry. It is ironic that Google, through its DeepMind subsidiary (e.g., AlphaFold and AlphaGo) and its invention of Transformer technology, was a pioneer in both predictive and generative AI. Additionally, it

succeeded in creating a search engine franchise.

However, Microsoft has effectively positioned itself as the leader in AI. Google's core search and corresponding $200 billion advertising business now face jeopardy as users abandon its offerings in favour of new AI search engines like Perplexity or Grok.

The Chinese Challenge

The arrival of Chinese Generative AI products such as DeepSeek significantly reshaped the AI marketplace by 2025, introducing a blend of innovation, competition, and disruption that has resonated globally.

First, there was DeepSeek, which claimed cost-effectiveness, although some experts are sceptical about their assertions of an order-of-magnitude improvement. Reports suggest that DeepSeek-V3 was trained for under $6 million using fewer, less advanced Nvidia chips (e.g., H800s) compared to the billions spent by U.S. firms. This efficiency arises from techniques such as sparsity in model training (focusing only on relevant parameters) and data compression, enabling high performance with lower resource demands. This lowered the barriers to entry.

Second, there is open-source momentum. Unlike OpenAI's proprietary models, DeepSeek has embraced an open-source approach, similar to Google's GEMINI and Facebook's LLaMA. Chinese tech giants like Alibaba and Tencent have also open-sourced their models (e.g., Qwen 2.5, Hunyuan), creating an "Android moment" for AI. These Chinese alternatives have eroded the pricing power of Western firms.

Third, there were geopolitical ripples: the US advocated for new investment, such as the $500 billion Stargate initiative. Concerns arose regarding Chinese products collecting data from various sources, especially as the Chinese government began treating its AI companies as "national champions" deserving of support.

The Chinese players changed the rules of the game: it is no longer solely about massive investments in the billions of dollars in proprietary systems, as seen in the US model, but rather enticingly about the potential to create LLMs using open-source Chinese products.

3. India's path to having a role in this domain

Objectives of Indian AI

The Indian government and society need to clearly understand how they want to position themselves within the expansive realm of Generative AI. In the authors' opinion, the focus should be on leveraging AI's capabilities for India's benefit; therefore, striving to build products that compete globally with current market leaders would be unrealistic.

Two essential steps are required to develop AI products that address the needs of Indian society: **debiasing** and **localisation**. Each of these steps is briefly described.

Current open-source models, even on matters that concern India, are primarily trained on sources from outside the country. Two examples will serve to illustrate the downside of this: (1) If Deep Seek is asked a question about Arunachal Pradesh, it responds that no such place exists. This is because Deep Seek, a Chinese product, does not acknowledge that Arunachal Pradesh is part of India. (2) If any Western model is queried about

the RSS, the answer will likely be that the RSS is a Hindu terrorist organisation. This is due to these models being trained on sources like Wikipedia, which are irredeemably hostile to India.

Eliminating such distortions is referred to as "debiasing." It may be overly ambitious to believe that we can *prevent* individuals outside India from receiving a distorted answer to a query. However, at the very least, we can ensure an alternative query engine provides more accurate information.

For several decades, there has been a notable trend of Westerners appropriating India's intellectual property. Examples abound: the healing powers of turmeric, Basmati rice, yoga, pranayama, and more. A strong nation with self-respect should aim to prevent future thefts and rectify past thefts.

Additionally, LLMs may begin to run out of training data, which could lead them to rely on "synthetic data" generated by AI or other artificial processes. This presents several issues: the amplification of existing biases in the models, a lack of real-world grounding, and the possibility of "model collapse," where genAI starts producing gibberish. Consequently, genAI companies would need to seek new real training data, and IKS could be "digested. "

In particular, traditional Indian Knowledge Systems (IKS) contain a wealth of material that can now be mined and appropriated by language models. To forestall this, it is essential to *codify* IKS in a format that unambiguously establishes the origin of the knowledge. This, in turn, requires *incorporating IKS* into an Indian Generative AI model, a process known as "localisation."

Specifically, building LLMs that specialise in IKS would be desirable. For example, there could be one trained almost exclusively on Panini's *Ashtadyayi*, which researchers could use to mine the depths of that masterwork and gather deep insights. In another example, recent cryptographic deciphering of the Indus-Sarasvati script might have been accelerated if there were an LLM that focused narrowly on the topic. Steps for achieving both objectives are described further below.

Approaches to Building an Indian AI Solution

Broadly speaking, two possible approaches to building a language model are **foundational** and **fine-tuned** (this phrase is not universally used). We discuss the advantages and disadvantages of each approach, placing particular emphasis on the Indian scenario.

A foundational model is essentially an *ab initio* model in which the model builders create their own pool of tokens from various data sources (public, proprietary, or both), select the model architecture, and then train the model by selecting the "weights" of the model. Generating a sufficiently rich corpus to produce realistic language models would require between 10 trillion and 100 trillion tokens and 500 billion to one trillion parameters.

Current models such as GEMINI, LLaMA, ChatGPT4, and Deep Seek all fall within this range. However, the cost would be substantially higher than for developing fine-tuned models. The IndiaAI mission envisages an outlay of Rs. 2000 crore, distributed over 6 to 10 projects (or Rs. 200 to 300 crore per project), with a six—to twelve-month development timeline for foundational models. In the authors' view, it is unrealistic to expect any *impactful* foundational model to be developed with this level of funding.

To build a fine-tuned model, builders start with an open-source model that best meets their requirements and then adjust the weights so that the model performs well on their own *additional* data set, which may be proprietary. The key is to ensure that while adjusting the weights, the performance of the corpus used to train the original model does not deteriorate.

This is tricky because, while the weights of an open-source model are freely available, *the corpus used to derive these weights is not.* Fortunately, a decades-old idea from statistics comes to the rescue. If the size of the additional data used for fine-tuning is several orders of magnitude smaller than the original corpus, an approach known as "Low-Rank Adaptation (LoRA)" can be employed. Currently available open-source models are estimated to be based on 100 trillion (10^14) tokens. Any additional Indian data would not exceed a trillion (10^12) tokens, or 1% of the original (unknown) corpus. This suggests that fine-tuning would work well in an Indian context.

Developing a high-quality, refined model would be significantly cheaper than creating a *meaningful* foundational model. This is because the initial step would involve an open-source model that has already gone through rigorous development and testing. However, according to the rules of the software community, any model built upon an open-source model must be put back into the open-source world. This would not be a drawback for India and might even be an advantage because it may lead to India being perceived as a significant player in this domain. In contrast, developing numerous relatively small models, distinguished only by their foundational nature, would not improve how the rest of the world perceives India.

What are the Skill Sets Required?

To build even a fine-tuned model, two distinct sets of skills are necessary: algorithms and software engineering. Most algorithms used in training LLMs are available in "pseudo-code" form in the open literature. Therefore, it is relatively straightforward (assuming one is familiar with the literature, which is not always a valid assumption) to convert this pseudo-code into working code, typically in Python.

No additional software engineering is required for relatively small models, such as those with 5 to 20 billion parameters. Environments like PyTorch handle issues such as parallelisation and memory allocation. It is highly desirable for the engineers involved in this project to begin with an open-source model of this size and to establish programmatic solutions for fine-tuning, including debiasing and localisation. This approach will help them gain insight into the algorithmic issues at play.

However, no meaningful model will be so small. The models on which we will be working, even if the starting point is open-source, will be a minimum of half a trillion parameters. Scaling up the solutions mentioned in the previous paragraph to this size would require an understanding of software engineering, including optimisation and algorithmic knowledge.

This is tacit know-how: "underground knowledge" that is usually not written down anywhere. Normally, only those who have "been there and done that" would know these aspects. Ideally, we should attempt to attract at least a few people who have worked on the large open-source models currently available. These people could, in turn, train others.

Budget and Time-Frame

A Phase-1 Proof of Concept based on an open-source model of approximately 20 billion parameters that achieves both debiasing and localisation can be prepared in six to nine months and would cost roughly Rs 600 crore. Phase 2, a fully functional version, would aim for a complete solution and would require around nine to twelve months, with a budget of about Rs 1200 crore.

However, this cannot remain a government-run initiative; the private sector must also contribute. Initially, this may occur through pilot projects using CSR funds. Still, in the future, comprehensive LLM development, training, data centres, and marketing must come from the private sector at a scale significantly greater than the initial public-sector investment. Targeted incentives are necessary to stimulate private-sector participation.

Potential Applications in Indian Society

While there are numerous ways in which Generative AI investment can benefit Indian society, we will focus on one area: education. Concerns persist regarding the poor educational attainment of Indian students, particularly in standardised global tests such as PISA, in which India has stopped participating due to dismal scores.

A significant factor in achieving success may be mother-tongue education at the primary and secondary levels, particularly in the hard sciences. Countries with high PISA scores, such as Finland, Japan, South Korea, and Germany, implement this approach. There may also be a cognitive advantage: you grasp concepts rather than grapple with unfamiliar English words.

By using LLMs trained with appropriate sources, we can provide high-quality translations into Indian languages, facilitating mother-tongue-based primary and secondary education. Numerous nations have demonstrated that this is not a disadvantage for future R&D. Additionally, in an environment where the Internet and social media encourage deracination, it may assist students in maintaining a certain cultural grounding.

Some argue that tertiary education should primarily be in English, but this can also be managed if LLMs provide real-time translation of lectures, allowing students to listen in whichever language they prefer. A significant side benefit of this approach would be the ability to conduct simultaneous translation between any Indian languages, making everyday communication much easier and effectively reducing some of the ongoing language conflicts.

Conclusion

Generative AI is here to stay, warts and all. It is up to the Indian state and private sector to take advantage of its presence and to participate in ways that do not directly confront the free-spending American and Chinese market leaders. There are niche/leapfrog or disruptive innovation plays that can create substantial value for Indian society by improving education, nurturing and protecting Indian Knowledge Systems, and easing multilingual communication.

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FOCUS

Fortifying the Digital Frontier: Protecting India's Cyber Interests

Prabha Rao*

Introduction

In the 21st century, the digital revolution has transformed how nations function, communicate, and compete. The rapid proliferation of digital technologies has created unprecedented opportunities for economic growth, social development, and global connectivity. India's digital transformation has been nothing short of remarkable. With over 800 million internet users as of 2023, India is the second-largest online market globally, trailing only China. The government's Digital India initiative, launched in 2015, has been a driving force behind this transformation, aiming to make India a digitally empowered society and knowledge economy. The initiative has focused on three key areas: digital infrastructure as a utility for every citizen, governance and services on demand, and the digital empowerment of citizens. The rapid adoption of digital technologies has profoundly impacted various sectors of the Indian economy. E-commerce, fintech, telemedicine, and online education have experienced exponential growth, particularly during the COVID-19 pandemic, accelerating the shift toward digital platforms. The Unified Payments Interface (UPI), a real-time payment system developed by the National Payments Corporation of India (NPCI), has revolutionised digital payments, making India a global leader in this space.

However, it has also introduced new vulnerabilities and threats, particularly in cybersecurity. The stakes are particularly high for India, a country with a burgeoning digital economy and a rapidly expanding internet user base. As India continues integrating digital technologies into every facet of its society, the need to fortify its digital frontier and protect its cyber interests has never been more urgent. India faces multifaceted challenges in the cyber domain; given the strategic importance of cybersecurity for national security and economic prosperity, it must take immediate measures to safeguard its digital infrastructure and interests.

An alarming 83 per cent of Indian organisations reported experiencing cybersecurity incidents in 2023.[1] The trend continues in 2025, and according to the National Cyber Reporting Platform (NCRP), there has been a massive surge of cyber criminals cheating people out of Rs 33,165 crore in the last four years, with several Tier 2 and 3 cities identified as hotspots for cybercrime.[2] Today's threat landscape is highly complex due to the millions of users and IoT devices connecting to enterprise

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networks, cloud applications, and data centres at a massive scale. Threats now extend beyond ransomware, distributed denial of service (DDoS), and phishing to include credential stuffing, supply chain attacks, social engineering, and cryptojacking.[3]

Extended use of artificial intelligence (AI) and the widespread availability of generative AI enable more sophisticated attacks, often exploiting older system vulnerabilities. Incidents of critical infrastructure being targeted by AI-synthesised malware have also been recorded in India, and the cumulative loss from cyber thefts and cybersecurity breaches has run into lakhs of crores.

Today, the need for a robust cybersecurity infrastructure is more evident than ever, given India's rapidly increasing digital footprint. Many government agencies and private enterprises in India still lack the necessary resources and capabilities to address their cybersecurity issues effectively. This situation has become a grave concern and must be addressed as a priority.

Given the above backdrop, the essential security paradigms necessary for today's organisations include Identity Intelligence, Network Resilience, Machine Trustworthiness, Cloud Reinforcement, and Artificial Intelligence (AI) Fortification.[4] These measures are critically important because in 2024, there has been a significant rise in identified malicious infrastructure intrusions. For instance, the number of unique, validated Command and Control servers (C2 servers) doubled from 2023 to 2024, while, correspondingly, unique, validated management panels saw a 69% increase over the same period.[5]

Victim identification based on the victim's IP address has shown that they are located throughout India. While major attacks have occurred in Delhi, Mumbai, Bengaluru, Chennai, and Hyderabad, there are now victims spread across India, including places like Jamtara, Mathura, Kohima, and Srinagar.

Current Cybersecurity Landscape in India: An Overview

There has been considerable disregard for cybersecurity in India, leading to challenges in addressing the nation's growing needs. Consequently, the cyber threat landscape in India has reached a critical inflexion point, unprecedented in both the volume and sophistication of attacks. Over 369.01 million distinct malware detections have been recorded across 8.44 million endpoints in the past year. It is important to note that eSignature-Based Detection accounted for 85.44%, while Behaviour-Based Detection comprised only 14.56%. This highlights that most threats are identified through traditional signature-based methods, indicating ongoing vulnerabilities to more sophisticated attack vectors.[6]

Some cybersecurity experts opine that these gargantuan figures represent but the tip of the iceberg, and we need considerably more expertise in identifying new and more innovative threat methodologies. It is important to note that today, the Predominant Threat Vectors are sophisticated Trojans and infectors, marking a strategic shift from easy-to-intercept opportunistic attacks to more targeted and sophisticated campaigns, leveraging advanced APTs and circuitous exfiltration routes.

Experts have identified the influx of potentially

unwanted programs (PUPs), potentially unwanted modifications (PUMs), and adware,[7] which cause severe commercial disruptions and revenue loss. PUPs are often bundled with free software, downloaded unintentionally, sideloaded through insecure sites, or distributed through deceptive advertising. While PUPs can compromise your privacy and security by tracking your online activity, they can be challenging to detect because they often disguise themselves as legitimate software or hide within other programs.[8]

Significantly, PUPs are often bundled with more dangerous PUMs that cause specific modifications to the Windows Registry, obfuscate its location, and make remediation difficult.[9] While many PUPs and PUMs are relatively benign, many have been used to plant Malicious malware. Cyber experts have given instances of malware such as Stuxnet, Flame, and Black Shades being implanted with PUPs and PUMs.

Adware is malware that displays unwanted advertisements on a user's computer or device and works by tracking a user's browsing habits to deliver more targeted and malicious ads. More importantly, adware enables data theft and cyber stuffing, apart from modifying browser settings to redirect users to unwanted websites and browser hijacking. The high prevalence of adware entry points to the monetisation of mobile-based cyber threats. Many of these malware types have evolved to be sophisticated enough to bypass standard virus scans. This issue is exacerbating India's inadequate cybersecurity capabilities.

Whether intentional or unintentional, insider threats pose a significant risk to organisations in India. Employees with access to sensitive information can inadvertently or deliberately compromise cybersecurity, leading to data breaches and other security incidents. The increasing trend of remote work, accelerated by the COVID-19 pandemic, has further complicated the challenge of managing insider threats. Several internal leaks from the armed forces and other security and intelligence agencies have primarily occurred due to internal fault lines.

On a disquieting note, India has frequently been a target of state-sponsored cyber espionage campaigns, particularly from neighbouring countries China, Pakistan, and now Bangladesh. Moreover, in an increasingly interconnected world, cyber threats can undermine national security. Cyberattacks on critical infrastructure, such as power grids, transportation systems, and financial networks, can have catastrophic consequences. For India, which shares borders with two nuclear-armed neighbours, the risk of cyber warfare is particularly acute. A successful cyberattack on India's military or nuclear infrastructure could have devastating implications for national security, as these campaigns often aim to steal sensitive government, military, and corporate information and disrupt critical infrastructure.

We must urgently note that India has fewer cybersecurity initiatives compared to other prosperous nations, which requires immediate attention. Several breaches have already occurred, including Chinese state-sponsored actors attacking the power grid in 2024 and 2020, the theft of UIDAI in 2022, and the data theft from AIIMS in 2021 due to a vicious ransomware attack. Below, I would like to provide a more comprehensive description of these attacks to illustrate the

vulnerabilities of our digital frontier and the urgent need to bolster our defences.

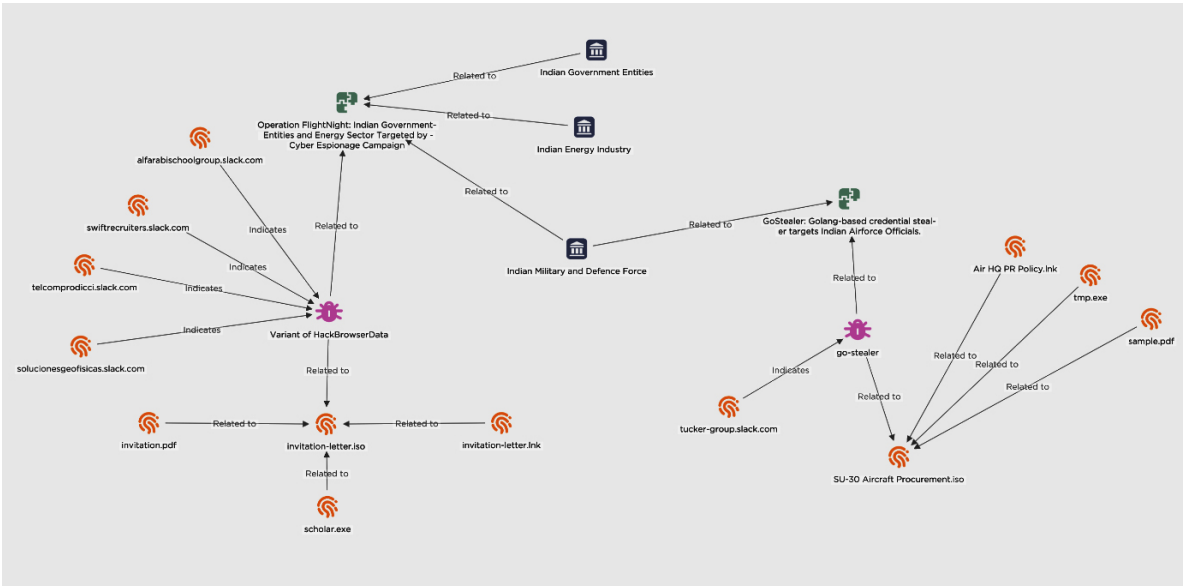
Attack on the Indian Power Grid

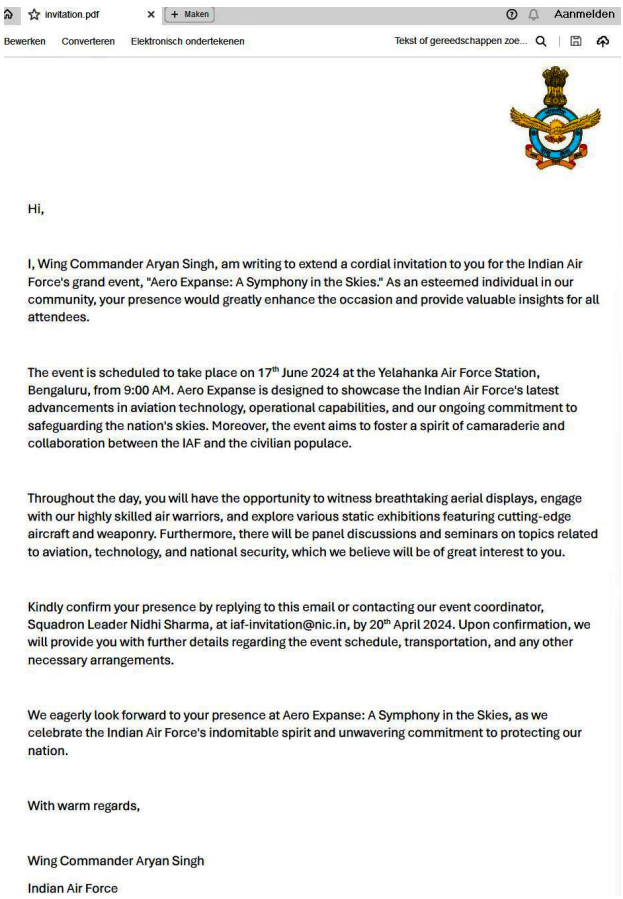
On March 7th, 2024, EclecticIQ, a cybersecurity firm based in Amsterdam, identified a cyber threat actor that utilised a modified version of the open-source information stealer HackBrowserData[10] to target Indian government entities in the energy and defence sectors. The hackers delivered the malware using a phishing email, camouflaged as an invitation letter from the Indian Air Force. The attacker utilised Slack channels to upload confidential internal documents, private email messages, and cached web browser data after the malware's execution. EclecticIQ analysts monikered the intrusion "Operation Flight Night" because each of the attacker's operated Slack channels was named Flight Night.

Deeper analysis showed that multiple government entities in India had been targeted, including MeitY and the Air Force, in addition to private Indian energy companies. The phishing activity compromised financial documents, employees' personal details, and information about drilling activities in oil and gas. The threat actor had used a PDF that appeared to be an invitation from the Indian Air Force, delivered within an ISO image file, which is commonly used to distribute software and operating systems. This format allows users to easily duplicate or install software without physical media.

In total, the threat actor exfiltrated 8,81 GB of data, which could significantly aid further intrusions into various entities of the Indian government, including critical ones.

The incident seemed to be a case of sophisticated cyber espionage, and the diagram below, sourced from EclecticIQ, provides an indication of the possible penetration achieved by the espionage activity. The letter purported to have come from the IAF is also shown below.





invitation.pdf

Maken

Aanmelden

Bewerken Converteren Elektronisch ondertekenen

Tekst of gereedschappen zoe...

Hi,

I, Wing Commander Aryan Singh, am writing to extend a cordial invitation to you for the Indian Air Force's grand event, "Aero Expanse: A Symphony in the Skies." As an esteemed individual in our community, your presence would greatly enhance the occasion and provide valuable insights for all attendees.

The event is scheduled to take place on 17th June 2024 at the Yelahanka Air Force Station, Bengaluru, from 9:00 AM. Aero Expanse is designed to showcase the Indian Air Force's latest advancements in aviation technology, operational capabilities, and our ongoing commitment to safeguarding the nation's skies. Moreover, the event aims to foster a spirit of camaraderie and collaboration between the IAF and the civilian populace.

Throughout the day, you will have the opportunity to witness breathtaking aerial displays, engage with our highly skilled air warriors, and explore various static exhibitions featuring cutting-edge aircraft and weaponry. Furthermore, there will be panel discussions and seminars on topics related to aviation, technology, and national security, which we believe will be of great interest to you.

Kindly confirm your presence by replying to this email or contacting our event coordinator, Squadron Leader Nidhi Sharma, at iaf-invitation@nic.in, by 20th April 2024. Upon confirmation, we will provide you with further details regarding the event schedule, transportation, and any other necessary arrangements.

We eagerly look forward to your presence at Aero Expanse: A Symphony in the Skies, as we celebrate the Indian Air Force's indomitable spirit and unwavering commitment to protecting our nation.

With warm regards,

Wing Commander Aryan Singh

Indian Air Force

The episode demonstrated how easily phishing activity can be conducted and the vigilance required to prevent it. It further illustrated that open-source software like Operation Flight Night and Go Stealer, along with Slack servers, can be easily modified for data exfiltration and used for data collection, cyber stuffing, and even cryptojacking.

The matter for serious introspection and concern is that the 2024 power sector attacks were preceded by another attack in March 2021. Border clashes between India and China in Galwan Valley in June 2020 resulted in casualties, the first in 45 years. While an all-out conflict was avoided through negotiations and diplomacy, China launched silent cyberattacks to create a conducive atmosphere for conducting espionage for potential disruptions. The Insikt group, the research wing of the Cyber Security concern, recorded future concern. Recorded Future, which has links with US intelligence agencies, observed numerous targeted incursions by Chinese state-sponsored agencies using the infrastructure tracked as AXIOMATICASYMPTOTE, which encompassed the Shadow Pad command and control servers to subvert India's power sector. The Insikt group found that ten Indian power sector organisations, including several Regional Load Despatch Centres (RLDC) responsible for operating the power grid by balancing electricity supply and demand, had been identified as targets, along with two seaports.[11]

Using a combination of proactive adversary infrastructure detections, domain analysis, and Recorded Future Network Traffic Analysis, it was determined that a subset of these AXIOMATICASYMPTOTE servers share some common infrastructure tactics, techniques, and procedures (TTPs) with several previously reported Chinese state-sponsored groups, including the Advanced Persistent Threat- APT41 and Tonto Team. APT41 has been used in earlier attempts to gain unauthorised access to restricted networks to steal sensitive data rather than disrupt services, and was noted during the UIDAI data theft episode. The clear indication of Chinese involvement emerged with the exposure of another Chinese-speaking APT, Tonto Team, which has been active since at least 2013. Tonto Team primarily targets military, diplomatic, and

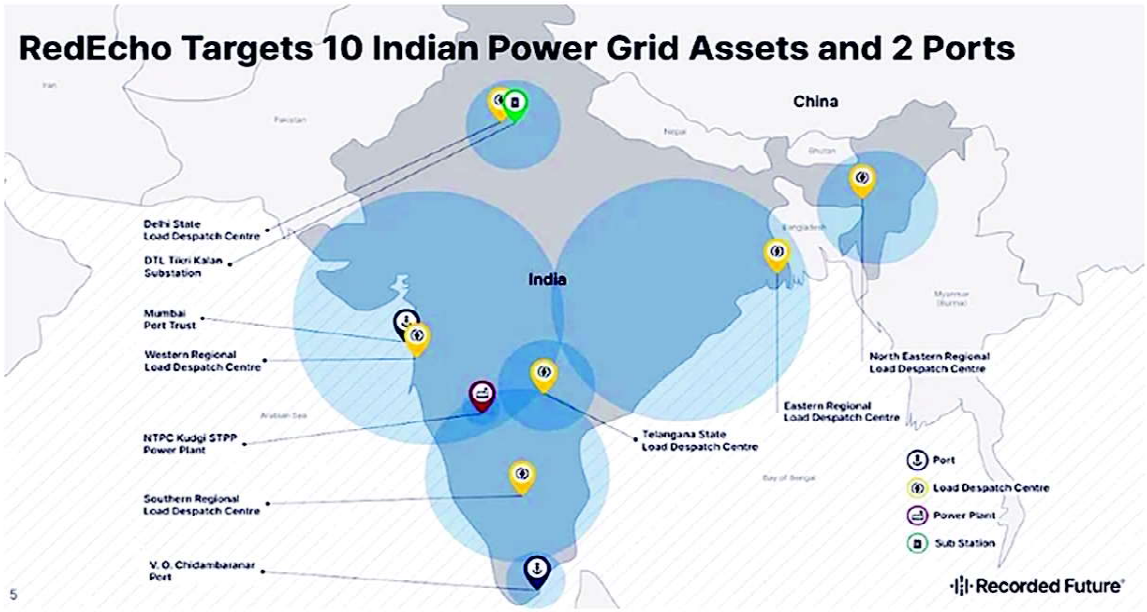
infrastructure organisations in Asia and Eastern Europe. The group has been observed using various malware, including the Remote Access Trojan (RAT), Bisonal and ShadowPad. They employ spear-phishing emails with malicious attachments as their preferred distribution method, which were identified.[12]

The needle of suspicion was firmly pointed in the Chinese direction after the Recorded Future team found in late 2020 that the Chinese State-sponsored APT Red Echo was sponsoring attacks on Indian power grids by pre-positioning malware assets within critical infrastructure, potentially for future strategic objectives, which included Shadow Pad and Tonto team. On March 3, a State Cyber Cell probe found 14 Trojan horses in the Maharashtra State Electricity Transmission Company servers, which could radically disrupt power distribution in the state. The primary malware was identified as Red Echo and caused the massive power outage in Mumbai in October 2020.[13]

Red Echo has a strong infrastructure and victimology intersection with Chinese groups APT41/ Barium and Tonto Team. ShadowPad is used by at least five distinct Chinese groups linked to the PLA. The Chinese fingerprints are undeniable.[14]

The Indian Government's assessment suggested that pre-positioning energy assets likely served as geostrategic signalling during heightened bilateral tensions and aimed to undermine confidence in the government by exposing its vulnerabilities. Unsurprisingly, Recorded Future found numerous IP addresses associated with critical Indian systems communicating with the APT for months.

An even more telling footprint was the use of infrastructure termed AXIOMATICA-SYMPTOTE to target a large swathe of India's power sector units and ports. AXIOMATICASYMPTOTE servers were connected to Red Echo, had domains that spoofed



those of Indian power sector entities configured to them, and also acted as command-and-control centres for the ShadowPad malware described earlier.

All twelve targeted entities have been classified as critical infrastructure by the National Critical Information Infrastructure Protection Centre (NCIIPC).[15]

Ransomware Attacks

Ransomware attacks have become increasingly common in India, targeting both public and private sector organisations. In November 2021, the Indian healthcare sector was struck by a series of ransomware attacks, including the attack on the All India Institute of Medical Sciences (AIIMS), which disrupted hospital operations when staff were unable to access the eHospital platform, which provides patient-centric services and compromised patient data. These attacks not only caused financial losses, as the threat actors demanded cryptocurrency through ransomware, but also highlighted the significant risk to public safety and national security.

The Sentinel Group, which first identified the APT, stated that it was ChamelGang (also known as Camo Fei), a suspected Chinese APT group that had targeted AIIMS. Earlier, in 2022, the Chamel Gang APT had drawn attention for targeting the Brazilian President's office, exfiltrating information, and asking for cryptocurrency through ransomware.[16]

The majority of the activities analysed by the Sentinel group indicated that the ChamelGang APT strategically utilised ransomware by cyber espionage actors for financial gain, or perhaps as a clever tactic for misattribution. Another motivation was that inadequate information sharing between the police, Revenue Service and Enforcement Directorates, financial intelligence units, and others could lead to insufficient risk assessment and diminished situational awareness. Ransomware is also advantageous from an operational perspective, as the data-destructive nature of this malware could collaterally disrupt systems and destroy intrusion and attribution data. In the case of a ransomware attack on critical infrastructure, the focus would be on restoring affected data and systems, providing a window of opportunity for further malicious activities.

The UIDAI Attack

Chinese targeting of Indian entities has expanded into a multitude of outlets and intrusions. In 2021, the Indian media group Bennett Coleman And Co Ltd (BCCL) - "The Times Group"; the Unique Identification Authority of India (UIDAI); and the Madhya Pradesh Police Department were targeted using the Winniti malware. Of these, the most sensitive and significant was the UIDAI, the Indian government agency responsible for the national identification database- the "Aadhaar", which contains private biometric information for over 1 billion Indian citizens. These intrusions were executed by an activity group designated TAG-28, in conjunction with another threat entity, 'pwn000', which posted on a breach forum that it had access to 815 million Indian Aadhaar records and put them up for sale on the dark web on October 9, 2023.

The Recorded Future cybersecurity group identified suspicious network traffic patterns

between two Winnti malware C2 servers and infrastructure registered to BCCL from February to August 2021. Subsequently, the Insikt Group identified four IPs assigned to BCCL that were engaged in sustained and substantial network communications with the two Winnti C2 servers (185.161.209[.]87 and IP 86.107.197[.]182) and a third probable Cobalt Strike C2 at 178.157.91[.]144. Approximately 500 MB of data had been exfiltrated from the BCCL network to the malicious infrastructure. The attack was believed to be in retaliation for the Times of India's coverage of the border tensions with China.

This was not a one-off act against the media. In 2013, a Chinese state-sponsored threat, APT12, compromised The New York Times. This coincided with the NYT's reporting on Chinese leadership figures, suggesting potential differences. It is further understood that another Chinese threat actor, APT41, has an operational scope to track individuals and conduct surveillance on media entities.

While investigating the infrastructure used in the BCCL compromise, Insikt identified an ongoing breach of the UIDAI, occurring between June 10 and at least July 20, 2021. During this period, two IPs registered to UIDAI were observed communicating with the same suspected Cobalt Strike C2 server used to target BCCL. This was in addition to the Winniti servers that had been identified and neutralised.

Madhya Pradesh Police was targeted using Winniti malware on June 1, 2021. The MPP IP, which serves a State Crime Records Bureau (SCRB) website that provides links to various web and mobile applications operated by SCRB, was targeted. Approximately 5 MB of data was exfiltrated, and the possible reason was that Madhya Pradesh Chief Minister Shivraj Singh Chouhan was critical of China after the violent border clashes with Chinese troops in the Ladakh region in June 2020, calling for the state's residents to boycott Chinese products. It appeared that the strike on the MP police was a warning against open criticism of China.

Winnti malware has been used by several Chinese state-sponsored groups, including APT41/ Barium and APT17, acting on behalf of China's Ministry of State Security (MSS). These examples demonstrate the vulnerability of India's cyber frontiers and emphasise the urgent need to secure our cyber defences and enhance our capacity to counter threats.

The Strategic Importance of Cybersecurity for India

The Indian Computer Emergency Response Team (CERT-In) has reported over 2.04 million registered cyber incidents in India in 2024, representing a significant increase from 1.39 million in 2022.[17]

India has emerged as the second most targeted country for cyberattacks after the USA and Israel. According to dark web data, over 95 Indian entities in banking and finance, government, healthcare, pharmaceuticals, and telecommunications have been affected. The number of unreported cases is likely to be about double that figure. As reliance on digital technologies increases and attacks become more sophisticated, the government must develop and maintain efficient and proactive cybersecurity

systems to prevent losses to critical infrastructure and consumers.

The digital economy is a key driver of India's economic growth. According to a report by the Indian Council for Research on International Economic Relations (ICRIER), the digital economy is expected to contribute $1 trillion to India's GDP by 2025. However, this growth depends on the security and resilience of digital infrastructure. Cyberattacks can disrupt business operations, erode consumer trust, and lead to significant financial losses. For India to realise its economic potential, it must ensure the security of its digital ecosystem.

Moreover, the internet has become an integral part of everyday life for millions of Indians, enabling access to information, education, healthcare, and financial services. However, the spread of misinformation, hate speech, and online harassment on digital platforms can undermine social stability. Cybersecurity measures are essential to protect individuals from online threats and ensure that the internet remains safe and inclusive.

Road Map for Sustainable Cyber Security

1. Capacity building for cybersecurity is a sine qua non for protecting our cyber frontiers. We need to establish effective systems to train a sizable workforce, which is currently in short supply.
2. We must also monitor the threat landscape to understand the tools and infrastructure tactics used for cyber terrorism, extortion, and subversion.
3. Identify state-sponsored groups. While the threats from Pakistan are easily countered due to a lack of sophistication, we must remain vigilant about a third country using Pakistani and now Bangladeshi IPs for phishing or creating deep fakes, etc.
4. Domain Name Systems (DNS) and web filtering solutions must be set up promptly to block access to known malicious domains and prevent users from accessing suspicious or harmful sites.
5. We must prevent any use of compromised infrastructure, especially in strategic and critical areas.
6. We must develop a deeper understanding of AI-powered cyber threats that leverage artificial intelligence to bypass traditional security measures and create more targeted, personalised, and automated attacks. These threats include AI-driven social engineering, phishing, malware generation, deepfakes, and data poisoning.
7. AI can also be used to automate the creation of malware and evasion techniques, and even exploit AI systems themselves, making them a significant concern for businesses and individuals.
8. We need to urgently promote Public-Private Partnerships, as there is often a lack of talent in either the PSUs or government institutions. The government should incentivise the private sector to invest in cybersecurity research and development, share threat intelligence, and participate in cybersecurity exercises and drills. This would also encourage innovation and

research and development in cybersecurity issues, enabling us to stay ahead of the curve in anticipating and preventing cyberattacks.

To sum up, Indians are highly skilled in software development and digital usage. We need to leverage our strengths and enhance our expertise in this crucial area of cybersecurity. We need to realise that our cybersecurity is as critical as the physical guarding of our frontiers.

As a rising global power, India has the opportunity to play a leadership role in shaping the future of the internet and cybersecurity. By developing a robust cybersecurity framework and promoting international cooperation, India can establish itself as a responsible stakeholder in the global digital economy. This will not only enhance India's global standing but also contribute to creating a secure and open internet for all.

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Illegal Immigration to India: Implications and the Way Forward

Sanjeev Tripathi*

Since gaining independence in 1947, India has been a major destination for individuals fleeing persecution, poverty, and political instability from neighbouring countries. India's geostrategic location, democratic ethos, and relatively strong economic condition have attracted waves of migrants and refugees from regions such as Tibet, Afghanistan, Sri Lanka, Myanmar, Pakistan, and particularly Bangladesh.

While some of these movements are rooted in humanitarian crises, others are driven by economic motives. The challenge lies in the lack of a structured legal framework that differentiates between genuine asylum seekers and illegal economic migrants. This legal vacuum, combined with porous borders and inconsistent enforcement, has made illegal immigration a persistent and growing problem with profound implications for India's national security, social fabric, and economic resources.

The Nature and Scale of the Problem

India's experience with immigration is complex. Refugees from Pakistan, Tibet, Afghanistan, and Sri Lanka have been handled with a mix of compassion and pragmatism, albeit in an ad hoc manner through executive orders. However, the influx from Bangladesh and Myanmar, both in terms of scale and impact, has largely remained unaddressed. Illegal immigration from Bangladesh has been a decades-long issue. India shares a 4,096-kilometre border with Bangladesh across five states—West Bengal, Assam, Meghalaya, Tripura, and Mizoram. This porous and often poorly managed border facilitates large-scale illegal crossings. Factors such as poverty, political instability, and religious persecution have driven millions to cross into India in search of safety and opportunity.

Though accurate data is hard to come by, estimates suggest that around 20 million illegal Bangladeshi immigrants- a figure quoted by the then Minister of State (Home) Kiran Rijiju in Parliament in 2016- may be residing in India. These individuals are often absorbed into informal labour sectors in cities, but their sheer numbers have led to noticeable demographic changes, especially in border states. A substantial number of these illegal Bangladeshi immigrants are non-Muslims who would eventually receive Indian citizenship under the provisions of the Citizenship (Amendment) Act, 2019. Their number is difficult to estimate but is certainly significant. The National Registration of Citizens (NRC) report released in Assam on August 31, 2019, in compliance with the 1985 Assam Accord, has identified over 19 lakhs illegal immigrants in Assam, of which around seven lakhs are Muslims and the rest are non-Muslims.

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The Rohingya crisis in Myanmar presents another dimension. As a stateless Muslim minority persecuted in Myanmar's Rakhine state, many Rohingyas have fled to India, often transiting through Bangladesh. The then Minister of State (Home) Kiran Rijiju informed the Rajya Sabha in August 2017 that the illegal Rohingya population in India exceeded 40,000. It is estimated that approximately 75,000 illegal Rohingya immigrants are currently living in India, with around 22,000 of them registered as refugees with the United Nations High Commissioner for Refugees (UNHCR) office in New Delhi.

The movement of Rohingyas into sensitive areas like Jammu and Kashmir raises significant security concerns. Moreover, the potential for their radicalisation exists, especially since global terror outfits like ISIS and Al-Qaeda have expressed interest in exploiting their plight. Given that most Rohingyas have arrived via Bangladesh, India is not their first country of refuge; thus, it may not have any international legal obligation to host them as refugees.

Socio-Economic and Demographic Impacts

Illegal immigration places a multi-layered burden on India's resources, economy, and society. These include: -

- Demographic Shifts: States like Assam, West Bengal, and Tripura have experienced significant demographic changes due to the influx, fueling local discontent and identity-based politics. The fear of cultural dilution has sparked widespread agitation, including the Assam Movement, which culminated in the Assam Accord of 1985 that has yet to be fully implemented.
- Strain on Public Services: Unauthorised immigrants, often living in poverty, place considerable pressure on public services such as healthcare, education, housing, and sanitation. In urban areas, they frequently reside in overcrowded slums, resulting in unsanitary conditions and heightened risks of communicable diseases.
- Labour Market Distortion: Illegal migrants willing to work for lower wages suppress income levels in labour-intensive sectors such as construction and agriculture. This displaces local workers and disrupts wage structures.
- Land Encroachment and Rural Unrest: Illegal settlers encroaching on agricultural and forest lands have sparked conflicts with local populations, especially in the Northeast. These disputes have exacerbated agrarian distress and fueled social unrest.
- Overburdening of Welfare Schemes: Without a robust identification system, illegal migrants can sometimes access welfare schemes intended for Indian citizens, thereby diluting the intended benefits of these schemes for Indian citizens.

National Security Challenges

The unchecked influx of illegal migrants also poses serious security concerns:

- Terror Links and Radicalisation: There is increasing concern that extremist groups may exploit migrant communities,

particularly vulnerable populations like the Rohingya, for recruitment and indoctrination.

- Border Security and Infiltration: India's eastern border is exploited not just for illegal migration but also for smuggling, human trafficking, and cross-border criminal activity.
- Communal Tensions: The presence of a significant number of illegal immigrants has at times led to ethnic and religious friction, as observed in Assam and parts of Tripura and West Bengal. These tensions are sometimes exacerbated by political mobilisation and misinformation, and they are also vulnerable to exploitation by India's adversaries.
- Political Exploitation: The issue of illegal immigration often becomes politicised. Vote bank politics has, at times, hindered effective policy responses, with some political parties hesitant to act decisively against illegal immigrants due to electoral considerations.

Legal Provisions

India is not a signatory to the 1951 UN Refugee Convention or its 1967 Protocol and has not developed any national refugee laws. As a result, the country lacks a formal mechanism to differentiate between refugees fleeing persecution and economic migrants seeking better livelihoods.

The legal tools that are currently available to address the problem include:

1. The immigration and Foreigners Act, 2025, grants the government the authority to detain and deport illegal immigrants, but does not distinguish between refugees and illegal immigrants.
2. Citizenship Act, 1955: Defines pathways to Indian citizenship but lacks clarity regarding refugee-related provisions.
3. Citizenship (Amendment) Act (CAA), 2003: This Act introduced a new section (Section 14A) in the Indian Citizenship Act, 1955, which mandates the compulsory registration of all Indian citizens, the issuance of National Identity Cards (NID), and the maintenance of a National Register of Indian Citizens (NRC). However, no progress has been made in this regard so far.
4. Citizenship (Amendment) Act (CAA), 2019: It offers a path to citizenship for persecuted religious minorities from three Islamic countries: Pakistan, Bangladesh, and Afghanistan, who have sought refuge in India. Action has been initiated to grant citizenship to such individuals who arrived in India until 2014. The process needs to be expedited, and those who have completed five years of residence in India should also be included in the process.

Addressing the Challenge: Recommendations and Way Forward

India needs a comprehensive and multi-pronged strategy to address the complex issue of illegal immigration, which should balance humanitarian concerns with national security imperatives and social harmony. It should include:

1. Strengthening Border Management

- Complete and Modernise Border Fencing: Using modern materials and technology, strengthen fencing along the Indo-Bangladesh border.

- Smart Surveillance: Use drones, motion sensors, AI-based facial recognition, and satellite imagery to monitor illegal crossings.
- Community Engagement: Involve local communities in reporting and preventing illegal crossings through awareness and incentive programmes.
- Improved Infrastructure and Patrols: Build all-weather roads along the border and increase the Border Security Force (BSF) presence in vulnerable regions along the Indo-Bangladesh border.

2. Enacting a National Refugee Law

India needs a national refugee law to legally distinguish between refugees and illegal immigrants. These two categories need to be dealt with differently. While the provisions of the Immigration and Foreigners Act, 2025 would apply in the case of illegal immigrants, the proposed refugee law should define the rights of refugees and outline procedures for their identification, registration, protection, and eventual repatriation or third-country settlement. However, in enacting such a law, India must protect its national interests and should, inter alia, include the following provisions in the proposed law: -

- Anyone who may otherwise be eligible for refugee status under this law will not be considered for such status if India is not the first country of refuge.
- Legal or illegal immigrants seeking refugee status in India must apply at designated locations within a specified period (say 3 months) of the enactment of such a law or within a specified period (say 3 months) of their entry into India, whichever is later. Failure to do so will render the individual ineligible for refugee status.
- The above provisions will not apply to immigrants for whom specific provisions for granting refugee status or citizenship exist, including those covered under the Citizenship (Amendment) Act, 2019.

3. Maintaining Biometric Records of Illegal Immigrants/ Refugees

Biometric records of all illegal immigrants, including asylum seekers, should be maintained to prevent them from fraudulently obtaining any other identity documents, such as Aadhar Cards or Voting Cards. Pending their deportation or the grant of Indian citizenship, they may be given temporary biometric residence permits. There should also be some restrictions on their movements, and sensitive areas, as declared by the government from time to time, as well as districts adjacent to India's land borders, should be kept out of bounds for them. In cases involving Rohingya immigrants from Myanmar, India should ask the UNHCR to provide the list of Rohingyas registered with them, along with their biometric details.

4. Issuing National Identity Cards to Indian Citizens

In South Asia, all countries except India either have biometric national identity cards for their citizens or are in the process of implementing this initiative. Sri Lanka, Pakistan, Bangladesh, and Bhutan have had a national identity card system for their citizens for a long time. Nepal also began this process in 2018, and soon all its citizens will also have national identity cards. In India, although the provision for the same exists following the addition of Section 14A in the Indian Citizenship

Act, 1955, through the CAA, 2003, no progress has been made in that direction to date. Apparently, the introduction of the Aadhaar Card, which establishes an individual's identity but not their nationality, has diminished the urgency of issuing the National Identity Card (NID).

Opposition to this exercise by some political parties appears to be another reason for the delay. The apprehension among certain sections that the process of providing NIDs and preparing the NRC could be used to target a particular community needs to be addressed by the government, which should also engage all stakeholders in the process.

For India, a major regional power, not having a record of all its citizens defies logic. Bangladesh, which shares a long porous border with India and where most of the illegal immigrants in India originate, has had a national identity card system for its citizens since 2006. Since 2016, it has replaced the paper-based laminated identity card with a biometric, microchip-embedded smart card. It is mandatory for all Bangladeshi citizens above 18 years of age to possess this identity card. As the national identity card is required for most day-to-day activities, it has become nearly impossible for illegal foreign nationals to survive in Bangladesh. Rohingya refugees in Bangladesh, who do not go to the refugee camps or choose to leave them, find it difficult to survive in the country and are likely to trickle into India. Therefore, India also needs to make extensive efforts to provide biometric NIDS to all its citizens. All public services and government benefit schemes must gradually be linked to the NID to prevent illegal immigrants from accessing those services and benefits.

Once all the countries in the region have biometric national identity cards for their citizens, it will be relatively easy to identify illegal immigrants from other countries and repatriate them to their country of origin.

5. Legal and Diplomatic Measures

- Bilateral Repatriation Agreements: Negotiate formal agreements with Bangladesh and Myanmar to repatriate their nationals residing illegally in the other country, following a thorough verification process.
- Regional Forums: Utilise platforms such as SAARC or BIMSTEC to enhance regional cooperation on migration issues, data sharing, and border enforcement.

6. International Cooperation

India is a major destination for refugees and economic migrants in South Asia. While it has handled these issues independently so far, the growing scale of immigration suggests that involving international organisations, particularly to address illegal immigrants from Bangladesh and Myanmar, could enhance the effectiveness of the response. Global bodies like the UNHCR and the IOM (International Organisation for Migration) can support India in managing illegal immigration. Although India has been cautious about involving the UNHCR, its experience in receiving assistance from the UNHCR for the repatriation of Sri Lankan refugees has been positive.

India has been part of the UNHCR's Executive Committee since 1995 and a member of the IOM since 2008. It may consider taking a more active role there, especially as Western countries, now facing similar migration pressures, may better understand.

India's Concerns

India has heavily invested in refugee welfare, particularly in the cases of Tibetan and Sri Lankan refugees. It has also committed to granting Indian citizenship to people belonging to religious minorities in three Islamic countries, namely Afghanistan, Bangladesh, and Pakistan, who have sought refuge in India due to persecution for religious reasons. This could be highlighted at the UNHCR to gain recognition as a significant donor.

It may also seek the UNHCR's support in facilitating the repatriation or third-country resettlement of Rohingya from Myanmar. Similarly, the IOM could assist in the repatriation of illegal immigrants from Bangladesh. Engaging with these bodies can help India manage illegal immigration more effectively while maintaining international credibility and humanitarian principles.

Conclusion

Illegal immigration from Bangladesh and Myanmar continues to pose complex challenges for India, impacting national security, economic stability, and social cohesion. The current approach, characterised by legal ambiguity and inconsistent enforcement, has failed to address the scale of the problem.

India must adopt a balanced and forward-looking strategy integrating stringent border control, robust detection and verification mechanisms, humanitarian responsibility, and international cooperation. A clear legal distinction between refugees and economic immigrants and a firm policy and enforcement framework is essential.

With timely reforms, India can protect its national interests while continuing to uphold its humanitarian tradition. Addressing illegal immigration is not only about ensuring national security and protecting borders—it is also about maintaining social harmony, promoting economic justice, and upholding constitutional values in an increasingly interconnected region.

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Safeguarding Against Subversion - Protecting Individuals, Institutions and Groups

Avadhesh Mathur*

While studying at Cambridge University, Kim Philby (b.1912) was convinced by Soviet Intelligence Officers that communism was better than capitalism. Kim Philby later joined the British Secret Intelligence Service (MI6), rapidly climbed the ranks and eventually became Head of the Section dealing with the Soviet Union. Throughout his career, he passed crucial information to the KGB. In 1951, suspicion arose when two other "Cambridge Five" members, Donald Maclean and Guy Burgess, defected to the Soviet Union. Although Kim Philby was investigated, he avoided exposure due to his powerful connections. However, in 1963, mounting evidence led to his defection to the Soviet Union, where he stayed until he died in 1988. His story remains one of the most striking examples of subversion and espionage.

Subversion refers to adversaries' efforts to undermine a country's individuals, institutions, and groups. It typically affects the state's power, authority, stability, or sovereignty through various means. While cases of subversion can involve political, social, and economic elements, they often include actions linked to espionage, terrorism, insurgency, the spread of disinformation, etc.

Typically, terrorists and insurgents employ a double-edged sword with subversion forming one edge and armed struggle the other. Subversion involves establishing front groups and penetrating and manipulating existing political structures, infiltrating security forces and other institutions of the state. Subversive groups also work through existing organisations, which provide legitimacy and attract international support. They also establish supposedly independent organisations that are created and controlled by others. By penetrating state institutions, subversive groups try to obtain information about government capabilities, intentions and weaknesses to help them plan false information. These groups also try to infiltrate academia and create their business empires.

In India, subversion has taken many forms over the past centuries, from ideological influence to manipulation of historical narratives and social/political movements. The routes of subversion can be traced back to British rule, which continued even after independence, and was heavily influenced by internal and external actors.

The British accentuated differences between different communities, regions, and religions. British historians like Lord Macaulay distorted the

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image of India by denigrating Indian heritage, education, and culture. He projected Indians as "uncivilised," leading to a loss of self-confidence in Indian society. Post-Independence, one of the most significant influences was Marxist ideology in education and the intelligentsia.

Yuri Bezmenov worked in the Soviet Embassy in India in the late 60s. After he defected to the US in 1985, in an interview with an American filmmaker, he disclosed that he was assigned the task of suborning Indians. Huge funds, manpower, and time were used in this effort. He disclosed that it would take 15 to 20 years to demoralise a nation, as ideology takes that much time to take root. Publishers, journalists, writers, editors, actors, teachers, professors and Members of Parliament were identified for this purpose. Even in the film-making, poverty was shown as a virtue to promote socialism and Marxism. The Naxalite movement was an offshoot of such an ideological subversion. Marxist historians like Romila Thaper and Bipan Chandra downplayed India's culture and heritage and glorified foreign influences. Mughals were shown as secular, and the British as making India "civilised". Meanwhile, religious subversion by way of showing Hinduism full of caste discrimination led to the promotion of conversion and sectarian divisions under the guise of "social service and education".

Other key aspects of subversion in India, besides Left-Wing Extremism, include separatist movements in Jammu & Kashmir (backed by Pakistan) and in the North East. Other subversive fronts include religious extremist Islamist groups like the Indian Mujahideen and LeT affiliates wanting to destabilise society through violence.

Western NGOs and think tanks have also been found to fund anti-India propaganda under the guise of "human rights." Foreign entities and their supported think tanks have financed protests like the anti-CAA and Farm Laws agitation. They attempt to exploit caste, religious, and ethnic fault lines to create unrest. They misuse the judiciary, media, and bureaucracy to stall governance through frivolous PILs, biased reporting, and infiltration in educational institutions to radicalise youth, among other tactics.

Some Western think tanks, like the Open Society Foundation, have a geopolitical agenda that indirectly seeks to shape policies in India. These think tanks also engage in narrative building through "reports" and policy papers, often exaggerating or fabricating human rights violations in Kashmir, Punjab, or the North East to justify foreign intervention. Some of these think tanks have hosted pro-Khalistan and pro-Kashmir independence voices under the guise of academic freedom. They also amplify disinformation. Research papers and conferences can sometimes be used to legitimise biased claims (for example, portraying India as an authoritarian state) that align with foreign interests. Certain think tanks promote policies favouring foreign deals, climate regulations, or trade terms that may not align with India's strategic autonomy. They also attempt to influence bureaucrats and politicians by offering fellowships, consulting roles, or sponsored trips.

On the other hand, both China and Pakistan are involved in promoting, sheltering, and funding insurgent groups in the Northeast. Insurgencies in the North East have resulted from the influence on young minds against the democratically elected

governments. Both internal and external factors have played a role in this subversion. In a recent case, a U.S. scholar tried to portray the insurgency in the Northeast as the Indo-Assam, Indo-Nagaland, Indo-Mizoram, and Indo-Manipur Wars. The minds of children are subverted in madrasas in Pakistan to convert them into human bombs.

Right from 1953 when the elected Prime Minister Mossadegh in Iran was overthrown under CIA's operations TPAJAX by instigating a public revolt to regime change in Bangladesh, subversion is being used to malign existing systems by way of mis-information, creating activist groups blaming governments for acts of violence, discrediting the policies of the govt., using judiciary to launch false cases etc.

Recent revelations indicate that USAID allegedly provided the New York-based East-West Management Institute (EWMI) with US$270 million over 15 years, with another US$90 million in the pipeline, to engineer political outcomes in several countries, including India and Bangladesh. Among EWMI's partners in the US was billionaire of Hungarian origin George Soros's Open Society Foundations (OSF).

Bangladesh's former Prime Minister, Sheikh Hasina who was overthrown on 5 August 2024, has accused Washington of undermining her government through an extensive web of influence operations, allegedly in retaliation for her refusal to cede control of Saint Martin's Island, in the Bay of Bengal to the US which was planning to set up an airbase there to control China.

However, currently, the primary threat is from the cyber world. Cyber operations provide strategic gains without going to war. Due to the scale of communication networks, particularly the vast audiences of social media platforms, cyber operations affect public opinion on an unprecedented scale. Allegations of election meddling targeting the 2016 US Presidential election attributed to Russia provide a contemporary example of such cyber manipulation operations.

Similar efforts by vested interests are made in India when electronic voting machines (EVMs) are repeatedly challenged. These campaigns aim to exploit social media networks to secretly manipulate voter preferences towards the party of their choice. There is also evidence showing that Cyber operations can affect critical infrastructure, causing economic disruption and achieving a temporary institutional shutdown, affecting the functioning of the government.

Threats to India

India remains under constant threat of subversion by inimical groups, both internal and external. Whether it is the so-called Khalistan movement, agitation by farmers, or protests against building dams, nuclear power plants, or mining for critical minerals, so-called NGOS and think tanks take up their causes to "safeguard heritage, cultural values and environmental protection."

Action Required/Taken

Misinformation, disinformation, and hate speeches spread through social media try to lead to violence, exacerbating divisions and conflicts and affecting the integrity of the nation. A balance between free speech and safety and security is required. Social media platforms need to be held

accountable for their posts. The human and technology resources deployed by these platforms should be asked to work towards proactively removing malware content. The national digital ecosystem requires robust fact-checking, verification, and validation. AI should be used to trace malware content.

Meanwhile, the government has already taken steps to monitor foreign funding by NGOs and think tanks under the FCRA. The National Investigation Agency (NIA) and the Enforcement Directorate (ED) have launched investigations into suspicious funding patterns against organisations like Oxfam.

Agencies have also been tasked with tracking foreign-funded research influencing Indian policies. The government also regularly issues statements contradicting biased reports from misleading think tank publications. Indigenous think tanks like the India Foundation, which provide the correct perspective, are doing a great job in this connection.

The government has also implemented the Unlawful Activities Prevention Act, banning terrorist and separatist organisations. The government regularly supports the FATF to put pressure on Pakistan to curb terror financing. Military crackdown in Kashmir in the aftermath of the post-Article 370 abrogation and anti-Naxalite operations have yielded promising results. Due to data security concerns, Chinese apps like TikTok and WeChat have been banned. Indian Cyber Coordination Centres have been created to counter online threats.

Digital is an extension of the geopolitical battlefield, and ignoring social media's weaponisation can have serious economic and security consequences. Concerted efforts need to continue through social media to curb radicalisation and the spread of extremist ideologies.

Subversion remains a persistent threat to India's sovereignty, requiring a mix of intelligence, military, legal and social/economic strategies. A continuous effort is needed to protect the national interest.

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Resilient Logistics: Security and Development of Border Areas

S Ravi Shankar*

Introduction

With the increase in extreme weather events, the disaster-prone Northern and Northeastern Borders experience regular disruptions of vital logistics routes, including the washing away of bridges. Simply constructing new roads and bridges is insufficient; these must be maintained at full operational capacity in a mission-mode approach to lower logistics costs. This will accelerate the pace of development in border areas and ensure sustainable military logistics, which together contribute to national security.

Numerous examples exist of poor responses leading to the underutilisation of National Highways (NHs), which often seems to go unnoticed. Although the losses are not easily quantifiable, they are real. Visualising this requires an understanding of logistics and the economic evaluation of a highway. Economic evaluation indicates what returns can be expected from the financial investment in building an expensive road- an analysis typically performed when sanctioning funds for a highway, yet often forgotten thereafter. The benefits calculated during an economic evaluation accrue only if the NH or any road is utilised to its full capacity. If capacity drops to 25% for several years (as is occurring along the border), the losses to the state are substantial. This situation sharply increases the ratio between logistics costs and GDP at a time when the Government is concerned that logistics costs account for 14% of GDP, compared to 7-8% in more developed countries. The case study of the Irang bridge discussed here exemplifies an uncoordinated, poor response, and losses to the state have also been quantified.

New technology can be a force multiplier, as demonstrated emphatically by the rapid response to a washed-away bridge in the Kedarnath Valley, utilising a 3rd Generation Modular Steel Panel Bridge (MSPB). A decade later, it remains the only one of its kind, and the response continues to rely on outdated modular bridges from World War II technology. A well-planned and proactive response can yield significant benefits. One example of rapid action was the BRO's response to the Sikkim Earthquake in June 2011. This case highlights the importance of anticipatory measures combined with clear delegation and determination in execution. The initiative displayed at all levels in this response is remarkable and serves as a model to emulate.

A need exists for deeper introspection to optimise logistics along our borders. The paper is, therefore, organised under the following headings:

- Recognising the Importance of Logistics Resilience in Border Areas.
- Irang Bridge- a Case Study to Quantify Losses Due to Poor Response.

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- The Impact of New Technology - a breakthrough in the Kedarnath Valley.
- The Sikkim Earthquake: Lessons from an Exceptional Response.

The Path Ahead – learning from experience.

Recognising the Importance of Logistics Resilience in Border Areas

The development of border areas and military logistics are interconnected. Recurring disasters affect both. We face this reality along the northern and northeast border areas year after year. Monsoons hitting the still-growing, unstable young fold mountains make the northern border landslide-prone; the lower reaches are flood-prone, and further northeast, during heavy rains, large tracts of land tend to sink. Together, these pose a continuous challenge to logistics. It demands resilient infrastructure, which should be planned for in our building efforts. However, much of the existing infrastructure is outdated and prone to disruption. Here, resilience requires a quick response to restore normalcy in the shortest time possible, ensuring we build better. Connectivity is key to development, and the most significant bottlenecks are bridges. In assessing the impact on logistics and ways to mitigate this, we must first understand the peculiarities of logistics in these areas and how they affect both development along the borders and military logistics.

A Holistic View of Logistics. Logistics involves transporting personnel and materials to the right location in the shortest time and at the lowest cost. Improved road connectivity contributes to this. Establishing logistics nodes closer to the served areas is also essential for reducing replenishment time while ensuring stock availability. Well-stocked logistics bases must supply a logistics chain that reaches the destination; for military logistics, this means delivering to the front line, to the forward trench, and all the way to the gun end, ensuring operations are not delayed due to shortages of supplies, ammunition, fuel, and clothing.

A crucial step toward enhancing military logistics is to develop the border states as robust support bases for the troops stationed ahead.

Improved logistics also enable economic development in border areas, strengthening border security. Economic development leads to better living conditions, a higher level of education, and a more stable society. It helps reduce undesirable external influences and promotes better integration with the rest of the country- economically, culturally, and socially. This enhances the security of the region. The efficiency of the forces along the borders is also improved by local support- by a motivated population, a thriving industry, and improved availability of local resources. Ask anyone in the forces who has fought a war along the Western Borders, and they will tell you how local support acts as a force multiplier.

Optimising Transportation Costs. It is common to see movement in smaller 6-wheel trucks (Load Class 18) in border areas, primarily due to weak bridges. Few realise how much transportation costs increase when using smaller trucks. Figure 1 illustrates a cost comparison using different truck sizes. When transportation is restricted to 6-wheel trucks, costs can rise by nearly 70% compared to larger 4-axle, 12-wheel trucks. Slow traffic caused by bottlenecks further

Transportation Cost Vs Truck Size.

	Type of Truck	Gross (tonnes)	Carrying Capacity (tonnes)	Rate Rs/Ton for 10 Km lead	% Increase wrt 12 Wheel trucks	Remarks
Rates as per SSR Bihar State wef 01 Apr 22 for Tpt of Aggregate	6 Wheel	18.5	10	137	71.3%	
	10 Wheel	28	18	99	23.8%	
	12 Wheel	35	25	80	0.0%	Taken as Standard
	14 Wheel	42	32	70	-12.5%	

Figure-1

adds to costs. Altogether, this leads to a 100% increase in logistics costs. Weak bridges are prevalent in border areas, and with each disaster, their number increases. Disasters in border areas, weak bridges, and logistics costs are interconnected. The following case study will explore how and why this is the case, aimed at quantifying the losses due to the sub-optimal, uncoordinated responses typical in these regions.

Irang Bridge- a Case Study to Quantify Losses Due to Poor Response

The case study on the Irang Bridge exemplifies how disasters, weak bridges, and logistics costs are interconnected, highlighting the urgent need to address these situations more effectively. It is a story that deserves to be told repeatedly so that its significance reaches the highest levels of national decision-making.

NH 37 (Imphal-Jiribham-Silchar) was handed over to NHIDCL in November 2017 by the BRO. It serves as a lifeline for Manipur. On November 1, 2020, the Bailey bridge at Irang collapsed while an overloaded vehicle carrying sand was crossing. The army was requisitioned, and repairs to the Irang Bridge began after de-installing a similar bailey bridge constructed at Tengnoupal along the Imphal-Moreh road. Due to its age, this bridge collapsed during the launch at Irang. The BRO provided another Bailey bridge, which was successfully launched on November 27. As always, the Army's effort was commended.[1] The bridge remained the same 52 m span, load Class 18, single-lane, and unsafe. It was far from being a resilient response.

Irang Bridge: NH37 Imphal-Jiribham-Silchar- Km 98.75

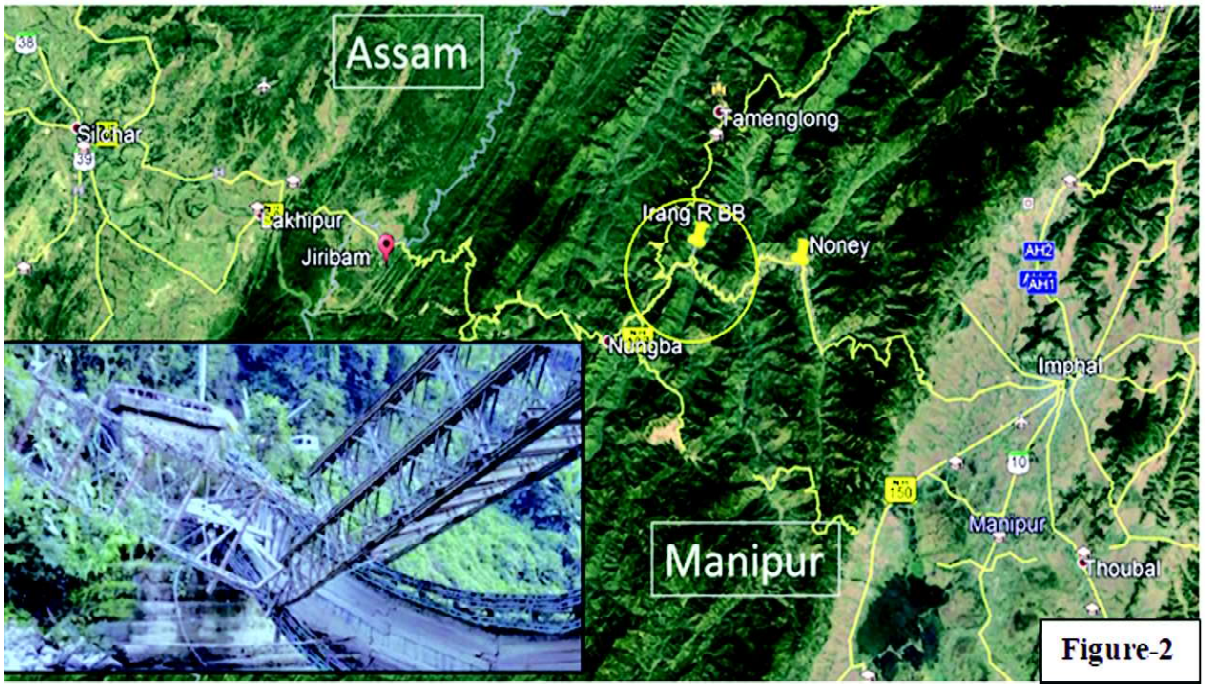

Figure-2

On May 2, 2022, the Irang Bridge collapsed again. It was replaced by yet another Bailey bridge, this time procured from Garden Reach, Kolkata, with the same specifications. The procurement and construction took three months. In June 2024, the Irang crossing experienced another Bailey bridge collapse. Fortunately, the permanent bridge was nearing completion. It opened to traffic, ending the saga of Bailey bridges collapsing regularly at Irang for over four years and finally clearing a bottleneck on the NH.

Financial Impact of a Weak Bridge on NH 37. NH 37 is designed for Load Class 70, accommodating two-lane traffic and allowing wheel-trains up to 100 tons to pass over the bridges. Installing a Class 18, single-lane bailey bridge *has reduced the NH's capacity to 25%.* One such bridge on the NH restricts vehicles' load on the entire highway, limiting it to 6-wheel trucks (see Figure 1). Traffic movement also slows with a single-lane bridge on a two-lane highway. This slow traffic has additional cost implications. Furthermore, the Bailey bridge is a temporary structure with a lifespan of only 25 years and requires early replacement. Most importantly, the bridge is unsafe, leading to the loss of property and invaluable lives with each collapse.

Figure 3 illustrates the financial losses incurred by Manipur State due to this weak bridge, based on reasonable assumptions[2]. The accumulated losses would be close to Rs 1000 crore per annum for just one highway. When all the highways along our borders, similarly affected by weak bridges, are considered, the losses to the nation reach staggering totals that have accumulated over the years due to the underutilisation of national

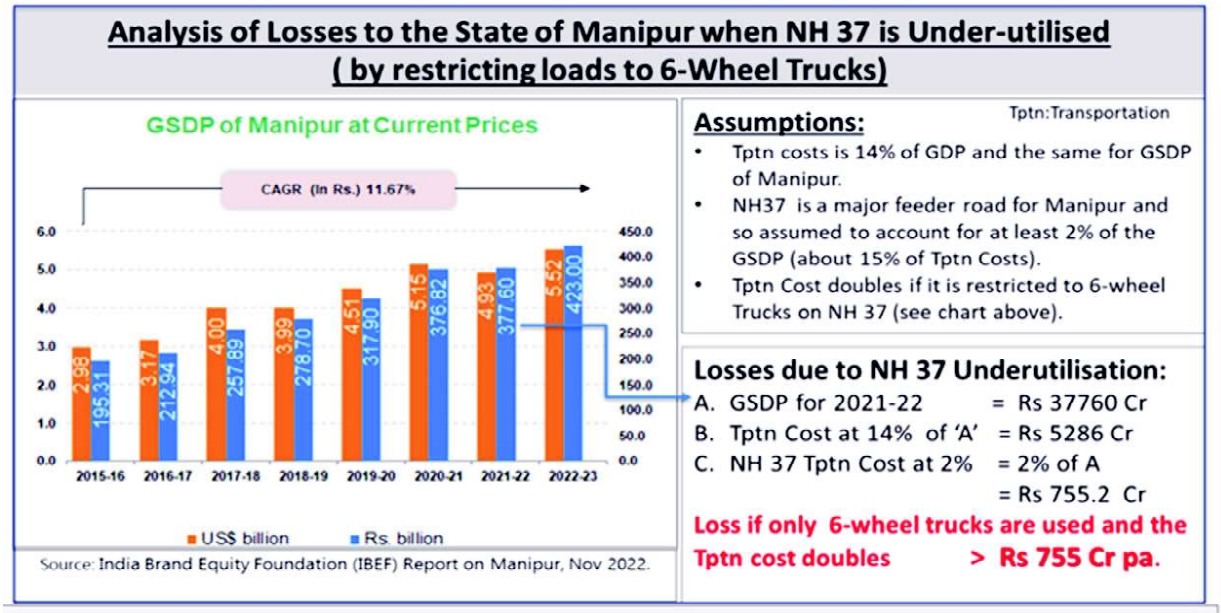

Figure-3

highways, on which substantial sums have been spent.

The Irang Bridge response clearly highlights how unprepared we are for the collapse of critical bridges in border areas, leading to increasing losses for the State. Development is hindered by additional transportation costs and a lack of heavy equipment, which necessitates stronger bridges. This situation undermines the very purpose for which the roads were built and must be addressed urgently.

New Technology for Bridges – a Breakthrough in the Kedarnath Valley.

The Irang Bridge is not an isolated example. Many such incidents occur each year, and the number of distressed bridges continues to rise as existing infrastructure ages and extreme weather events become more frequent. There is a need to transition to newer technology, evolving from the Bailey Bridge, a first generation Modular Steel Panel Bridge (MSPB), to third generation MSPBs.

Figure 4 illustrates a 3rd Gen MSPB that was launched in India in March 2016. This occurred after the permanent bridge was swept away by the devastating floods in the Kedarnath Valley in June 2013. The Bailey bridge installed in its place was also washed away in 2015. The launch of a new permanent modular bridge in record time in March 2016 represented a bold initiative by the Uttarakhand Government based on advice from their project consultants.[3]

Procuring such bridges thereafter has faced many roadblocks. Having been involved in launching the first such bridge in the country, one has participated in discussions on this. NHAI and

NHIDCL agree on the urgency but are not equipped to stock such bridges. The State PWDs and the BRO feel MORTH should address this. The NDMA was unwilling to take on a role in this matter. The Northeast Council was very clear that their role was to provide infrastructure; repairing and rehabilitating was out of their purview. However, all agree that there is an urgency for it.

The 60m, double lane, permanent ACROW bridge launched in record time at Sonprayag, en-route to the Kedarnath Shrine. (Mar 2016)

Figure-4

Quick responses require that such bridges be stored closer to where they are needed. Anticipatory action is crucial for quick response; the following example demonstrates this.

The Sikkim Earthquake – Learning from an Exceptional Response

Sikkim experienced a devastating earthquake of magnitude 6.8 on the Richter Scale at 6:10 pm on September 18, 2011 (see **Figure 5)**. The epicentre was in Chungtang, North Sikkim. Gangtok, the state capital, was completely isolated from the rest of the country. NH 31A from Sevok to Gangtok encountered 14 major landslides (see **Figure 6)**. Estimates for clearing the slides ranged from 4 weeks to 3 months. BRO, Project Swastik in Gangtok managed the highway, and as the Director General of Border Roads at that time, I was asked how long it would take. The first step was to gather feedback from the ground.

Chief Engineer of Project Swastik, responsible for this area, was in Kolkata at the Eastern Command HQ that day. The two TF Commanders were visiting sites and were caught on the wrong side of the slide, unable to return to their HQs. They could only connect to the Project HQ staff. The feedback around 10 pm indicated that stones were still falling. They were instructed not to attempt anything until the slides stopped. Working at night was also not advisable, so they waited.

Meanwhile, rescue teams were mobilised, and NDRF teams were flown in from Delhi. All could move to the foothills and no further. At Coronation Bridge near Sevoke, there was a pile-up of traffic, with everyone wanting to know when the road would be clear. Early in the morning, the Home Secretary requested an update. Nothing was clear even then. My cautious response was a minimum of 48 hours.

On the ground around 4 am, the dozer and excavator teams decided it was safe enough to work. They were spread along the NH, located at likely slide points identified from the previous years experience with heavy rains and slides. All the teams began clearing their stretches. At 12:30 that afternoon, I received a slip while attending a special meeting chaired by the Cabinet Secretary. It read that the road to Gangtok was open. I announced it. The road was open to Gangtok just 18 hours after the earthquake, not the six weeks (+) that the media had speculated.

This action set the pace for further efforts near Chungtang, filled with individual heroic stories and daring initiatives in the following days. The CE Swastik, during a helicopter reconnaissance, undertook a bold rescue attempt to retrieve a critical casualty from a precarious ledge, ultimately saving a life. Other construction agencies in the Chungtang area joined the effort, freely utilising their plants and machinery. The synergy was contagious.

It was one of the most dynamic responses I had ever experienced in my career. Initiative, commitment, and responsibility at the grassroots level were evident. The professional competence of the machine operators was exemplary. They demonstrated true grit and teamwork, showcasing the highest levels of motivation. The TF Commanders had anticipated and positioned their equipment effectively, providing clear directions and creating an environment for such a synergised effort. The action remains unique even today. What truly enabled this was the machinery strategically positioned in anticipation of heavy rain on NH 31 A. The legendary commitment of the BRO personnel on the ground again came to the forefront. Tragically, two of them lost their lives during the operation.

The stories received limited media coverage,

partly due to instructions not to share information with the media while work was ongoing, as media coverage can be disruptive and demoralising for most on the ground. Once the event was over, little interest was shown by the mainstream media; however, a team from Doordarshan, led by Dr Deepak Vohra (a multi-talented and energetic former Ambassador of India), followed up on the story and presented detailed coverage[4]. Dr. Vohra often refers to this experience as an anecdote during his motivational talks on 'Rising India' at various forums[5].

The Way Forward – Learning from Experience

Resilient logistics along our northern borders require a coordinated initiative at the national level, drawing from experience. Regular upgrades are essential. The first step is to assign a cost to the delays and inadequate responses. This will enhance appreciation for the value of quality responses, making planning more realistic. Quantifying losses to the state is challenging. The Irang Bridge case study aims to clarify the order of losses rather than determine exact costs. Many do not easily understand the concept of who will benefit from mitigating these losses. An attitudinal shift among decision-makers at all levels is necessary.

There is a need for a policy on resilient response that establishes pragmatic timelines and acceptable results, along with resources for quick response. For example, there is currently no timeframe for effective action by construction agencies for distressed bridges. Practical guidelines must be formulated so relevant agencies can prepare accordingly. To ensure a quicker response in an emergency, better Modular Steel Panel Bridges (MSPB) should be stocked and ready to reach the site within a reasonable timeframe of approximately 3 to 4 days after a mishap, enabling the highway to be restored to at least 75% of its capacity within 2 weeks. Full capacity should be targeted within a year if not sooner, to mitigate economic losses from a distressed bridge. Providing detours capable of accommodating full NH loads is also feasible with the improved MSPB. Therefore, the stocked equipment must accommodate permanent and temporary bridges, particularly in hilly terrain. The responsibility for response remains another grey area that requires attention.

Disasters are often rationalised as 'an act of God', rendering no one liable. However, responding to them is our responsibility and is inescapable. While many agencies construct new infrastructure, they expect others to be the first responders during disruptions. The losses do not impact them directly. A key area that needs urgent attention is the replacement of distressed bridges. The initial response when critical bridges collapse is typically left to the Army, who improvise with whatever resources they have. Although the response is widely appreciated for its speed and the determination displayed by the services, helping to relieve locals, it can hardly be deemed a resilient approach. It remains a temporary fix that stays sub-optimal for extended periods thereafter.

The Army also requires logistic bridges that can be deployed quickly. NATO specifies that two-way Class 24 bridges must have a minimum width of 5.5 meters. This width can accommodate single-lane Class 70 traffic, which is necessary for carrying the heavier loads projected by them

to MORTH. This is the minimum that the Army should plan to ensure a more resilient logistics chain during operations along the Northern Borders. Additionally, any operational plan must include the ability to respond effectively to disruptions. As the first responders during disasters, the Army's inventory could encompass such bridges, which would be advantageous for both civil and military purposes during peacetime, thereby enhancing the Army's logistics resilience during hostilities.

The industry will gear up to meet these requirements only if there is sufficient demand and clarity regarding what is needed. The technology and design skills are not lacking; what is missing is someone to take the lead in firming up the requirements. Too many agencies require such bridges, each waiting for someone else to take the initiative.

Anticipatory action and clear delegation are crucial for a swift response. Alongside responsibility, efficiently allocating resources is essential through simple mobilisation drills. The current disaster response procedures must address the gaps identified through experience and respond to them promptly. Delays come at a significant cost. Complicating matters further is the number of agencies involved. Effective coordination necessitates an apex body to oversee operations with the authority to implement decisions, where ultimate accountability lies.

Conclusion

To summarise, resilient logistics along our borders are essential for both the development of border areas and military logistics during peace and war. Disruptions to logistics in these areas come at an enormous cost to the state and are being ignored. Recognising the value of resilient logistics can lead to more pragmatic policies and funding for this endeavour.

The examples given here reflect the experiences of just one person. Institutional memory offers a broader perspective. Learning from these experiences must be formalised to assist with regular upgrades. Action must be coordinated at the highest level because logistics, infrastructure, and border security involve multiple ministries and numerous government agencies. They need to be synergised to enhance the resilience of logistics. Anticipatory action, informed by experience, will remain the key to a quick and resilient response.

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2 *Table in Figure 2 has been prepared based on the GSDP data obtained from 'Report on Manipur, Nov 2022 by Indian Brand Equity foundation (BEF)' and thereafter making reasonable assumptions for the computation.*

3 *Launch of First 3rd Gen Modular Steel Panel Bridge in India. The bridge was launched at Sonprayag as a part of the Uttarakhand Disaster Relief Programme, funded by the World Bank. The author was a part of the consultancy team for design of bridges in this project. More details available in a Case Study of this Bridge published in CEAI Magazine, Viewpoint, Dec 2021 Edition, Pages 91-99, by Lt Gen S Ravi Shankar.*

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The Defence Sector: Challenges to Self-Reliance

Kapil Aggarwal*

The government unveiled the Atma Nirbhar Bharat policy (self-reliance) on 12 May 2020. The policy envisions boosting domestic manufacturing, improving infrastructure, and supporting MSMEs through economic reforms and incentives. It also aims to enhance local supply chains, promote innovation, and create a more self-reliant economy. The ultimate test of this policy's success will be the effectiveness of the self-reliance policy in the defence sector, considering that the Ministry of Defence has the largest allocation of funds among all ministries each year, a significant portion of which is designated for importing military equipment, including aircraft, warships, guns, and tanks. Determining how to phase out these imports and gradually shift to indigenous design, development, and manufacture of state-of-the-art platforms and weapon systems will be a key factor not only in the success of the self-reliance initiatives in the defence sector but also in the overall accomplishments of the Atma Nirbhar policy.

The magnitude of the challenges to self-reliance in the defence sector is evident from the fact that for a long time, India has been the largest arms importer in the world. It is only during the recent period of 2020-24 that Ukraine has surpassed India as the largest importer, due to the war with Russia. According to the latest SIPRI report,[1] India still accounts for 8.3% of global arms imports for these five years, compared to a share of 9.1% during the previous five-year period of 2015-19. This decrease may be partly due to a focus on Atma Nirbharta, indigenisation, and enhanced ability to design and manufacture some military hardware. However, the import dependence remains significant as India continues to be the second-largest arms importer, indicating a strategic vulnerability from which India should extricate itself as soon as possible.

It will be worthwhile to compare the arms imports of India vis-à-vis China over the last 15 years. Based on the data provided in the SIPRI report, this is represented in the chart below. Just two decades ago, China was the largest arms importer in the world, its share of global arms imports being 12%. However, China's import dependence has drastically reduced, and its share of global arms imports is now just 1.8%, a tribute to its indigenisation efforts. China now ranks 16th on the SIPRI arms importers' list.

However, Mr. Bhartendu Kumar Singh feels that the import figures from China do not accurately indicate the prowess of its Military Industrial Complex (MIC). He states,[2] "A sharp drop in China's share of global arms imports may give the impression that its MIC has crossed a critical hurdle. However, it is premature to reach this conclusion as supply disruptions in Russia and Ukraine, among the largest arms suppliers to China,

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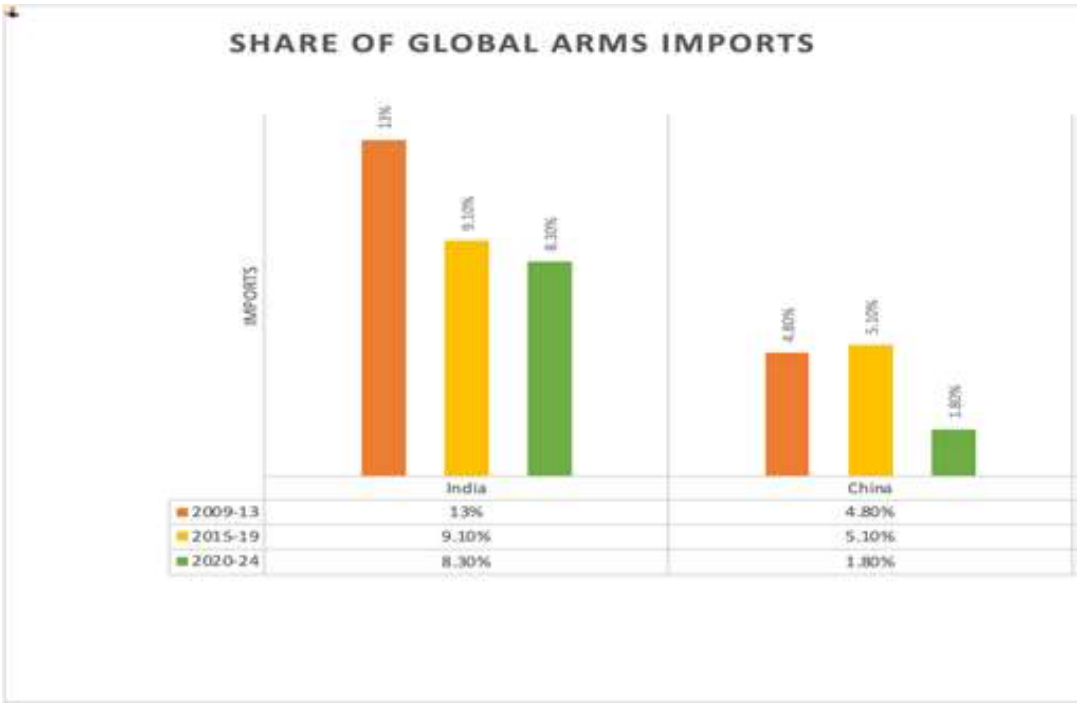


may have distorted the data. It is China's dwindling share in global arms exports that provides a truer picture of China's MIC." This implies that multiple parameters must be accounted for when assessing self-reliance in defence manufacturing.

Defence Industries: A Multi-Faceted Asset

A capable defence industrial sector or base must be recognised as a multi-faceted national asset. It is critical for delivering security in an increasingly uncertain world. There are three core elements[3], namely 'Defence' (policy formulation and implementation through decisions), 'Industries' (providers of goods and services) and Society (the source of manpower, other resources, discourses and permissions), which are culturally interdependent as they combine to generate the Defence Industrial Ecosystem. In the words of Ashton B Carter, the US Under-Secretary of Defence for Acquisition, Technology and Logistics[4], "A strong, technologically vibrant, and financially successful defence industry is therefore in the national interest. In this respect, the warfighter's and taxpayer's interest are fundamentally aligned with those of the industry stakeholders."

The Defence Industry stakeholders in India primarily comprise DPSUs, some prominent private sector enterprises, and numerous MSMEs manufacturing components, forming the supply chain. The Defence Industrial Base (DIB) reportedly has 16 DPSUS, over 430 licensed companies and approximately 16,000 Micro, Small and Medium Enterprises (MSMES). Defence Minister Shri Rajnath Singh announced during the Aero India 2025 show in Bengaluru that the DIB has achieved a record defence production of Rs

1,27,265 crore[5] in the FY 2023-24. This is an impressive increase of approx 174% from Rs 46,429 crore in FY 2014-15. The goal is to transform India into a global defence manufacturing hub while fostering self-reliance. The expected defence production in the FY2024-25 is Rs 1.75 lakh crore, with aspirations to achieve a production target of Rs 3 lakh crore by 2029.

Travails of Transfer of Technology (ToT)

Traditionally, the approach of the DPSUs and even the private sector has been to establish manufacturing facilities of Weapon systems / Platforms of foreign origin under Transfer of Technology (ToT) from OEMs while simultaneously attempting to indigenise the subassemblies/components. The foreign OEMs mainly offer an incomplete ToT, withholding critical technological design know-how and protecting their intellectual property rights (IPR). At the same time, no attempts are made locally to bridge the technology gap. Thus, for half a century now, we have been manufacturing 780 HP and 920 HP engines of armoured fighting vehicles without developing the capability of designing and manufacturing 1000 HP or more engines.

Consequently, in any new indigenous MBT or light tank program like Project Zorawar, we are again looking to import the power pack and integrate the various systems here under the flag of indigenous development. ToT has also not enabled speedy indigenisation of spare parts; BEML was to indigenise 86% of TATRA spares within 5 years[6] but has achieved only 62.5% after 26 years. Similarly, the Ordnance Factory Board (OFB), now corporatised, has been unable to fill the gaps in the indigenisation of components of the T–72 tanks and BMPS I/II[7] through HVF Avadi and OFM Medak, respectively. The fiasco of the development of a 10,000 kg thrust engine (Kaveri), a very complex technology over almost three decades by the Gas Turbine Research Establishment (GTRE), set back the whole LCA program and again forced Hindustan Aeronautics Ltd (HAL) to take the GE–404 engine ToT approach.

As part of the ToT approach, DRDO is currently seeking both domestic and international partners to develop indigenous 3000+ HP marine diesel engines for Project–76 submarines[8], since India lacks established expertise in designing and building high-performance marine engines. As part of its key objective, the indigenous content target has been hiked to 90 – 95 %

The Transfer of Technology (ToT) obtained from various foreign OEMs over the years has not succeeded in advancing the objectives of self-reliance in the manufacturing of defence equipment. It has primarily facilitated the assembly and integration of various subsystems while manufacturing some non-IPR components under license. The OEMS do not share any inputs on material technology or insights into manufacturing processes. Furthermore, the Defence Offsets Policy has not yielded the desired results and may have inflated acquisition costs. Therefore, a de novo approach must be adopted when inducting any foreign weapon system or platform; it may be time to pivot from ToT to Absorption of Technologies (AoT) along with innovative technology upgrades. This shift will require suitable policy measures to

be formulated and incorporated into the acquisition procedures, empowering establishments like DRDO, DMRL, MIDHANI, and GTRE with an upgraded R&D mandate.

Technology Involved Along with R&D

Weapon systems and platforms required by the defence forces invariably involve a convergence of top-notch cutting-edge technologies. Thus, a fighter aircraft employs state-of-the-art aeronautical engineering, jet engine technology, avionics, sensors, fly-by-wire technology, precision-guided munitions, surveillance and electronic warfare technologies, etc. An armoured fighting vehicle or a tank is a system-of-systems, integrating mechanical engineering (power pack), armament technology, fire control system, sighting system, gun control system, communication system, NBC protection, etc. In all such weapon systems or platforms, prowess in metallurgy, rubber technology, control systems, etc, is a must. It is difficult, if not well-nigh impossible, for a single manufacturer or entity to have all the capabilities required to produce or integrate a particular defence equipment. For example, the Su-30 MK I aircraft manufactured by HAL, under license, has systems and components supplied by 14 manufacturers in six nations.

In such a technological scenario, if India can move from the estimated self-reliance level of 25 – 30% to a figure of 75 – 80%, the goal of self-reliance should be considered as achieved. One critical factor in developing new technologies and their employment in the design and manufacture of defence equipment is the investment in R&D. Currently, India spends only approximately 0.7% of its GDP on R&D, much lower than the world average of 1.8%. Countries like the US and China reportedly spend about 2.8% to 3.5% of their GDP on R&D. Israel, a major exporter of defence technologies is the top spender, almost 6% of GDP on R&D. China is continuously increasing its R&D investments for the last 25 years and is expected to surpass the US by 2026. Because the GDP of the US and China is 6 to 8 times bigger, the enormity of asymmetry in defence R&D spending can be comprehended. Consequently, as per the Global Innovation Index 2024, India's global ranking is at a low 39th (amongst 133 global economies)[9], a slow improvement from the rank of 48 five years back.

A helpful comparison for R&D spending can be made with South Korea, a nation that used to have an agricultural economy like India, with a low-skilled and labour-intensive industry. However, in the 70s, Korea shifted gears, investing heavily in R&D, sending the economy into higher orbit. Today, it spends 5% of GDP on R&D, 79% of which is from the private sector. Compared to India's R&D spend of 0.75% of GDP, of which only 0.41% comes from the private sector, Samsung spends 8-11% on R&D, while Reliance spends a paltry 0.6%. Tata Steel, ITC and Maruti have cut down R&D spends in the last 5 years. Korea encourages its Chaebols (Samsungs and Hyndais, LGs etc) first to undertake the difficult long gestation period R&D and only then gives preferential government treatment. Conversely, India is rolling out export promotion policies, Production Linked Incentive scheme, vocational training and handholding MSMES without stressing on R&D first. It is clear that R&D not only bolsters corporate houses but also energises industries.

Another indicator of focus on R&D is the number of scientific papers published in international journals and the number of patents granted. This results in innovation and the development of new technologies. Here, the asymmetry gets further skewed as India has a minuscule number of patents granted over the years. The corollary is that an increase in R&D budget is an indispensable component of the strategy, which must be implemented to achieve a higher self-reliance quotient. Overall, if spending on R&D is enhanced to about 2% of GDP, it will be a big boost towards the quest of being Atma Nirbhar. A welcome development, announced last year by the government, is the setting up of a National Research Foundation (NRF) with a corpus of Rs 50,000 crore for R&D over five years. This will foster a culture of R&D in Universities. Colleges, Research Institutions and R&D labs.

There are now indicators that the Central Government is aware of R&D challenges. Niti Aayog recently wrote to 350 scientific institutes and labs to identify key bottlenecks affecting research and R&D scale-up[10]. The government intends to focus on three reforms: Funding, Regulatory framework (streamlining grant rules), and Institutional benchmarking (R&D scale-up and monetisation).

Promotions and Incentives

Defence manufacturing is not only a function of national economic resources allocation, i.e., the R&D budget / NRF, but is also based on the industrial base in the country. This industrial base or ecosystem needs to synergise the respective strengths of the public and private sectors. Since the design, development and manufacture of defence equipment requires long gestation periods, industry, particularly the private sector, needs to be suitably incentivised.

Defence manufacturing also requires skilled human resources, suitable civil and technical infrastructure, and an integrated ecosystem to flourish. It takes years, if not decades, for R&D to succeed, prototypes to be made and tested, and a manufacturing line to be set up with all the supply chains. There has to be hand-holding of innovators and system integrators; ideally, a public-private partnership model has to be put in place where part funding of the private sector is enabled and their costs amortised. Collaboration and not competition amongst agencies involved in defence projects has to be encouraged.

The government has been steadily increasing the FDI limits in the defence sector, which are currently set at 74% (automatic route) and 100% (government route), to make the Indian defence industry an attractive investment destination. Foreign OEMs can take advantage of the cost benefits of manufacturing in India and exporting to other regional countries. As technology infusion necessitates collaboration with foreign OEMs, Indian and foreign OEMs should establish joint ventures and special-purpose vehicles that incorporate both manufacturing and R&D components. The government may also consider expanding the Production Linked Incentive (PLI) scheme in a few carefully selected defence manufacturing sectors, such as assemblies and modules currently being imported. This will encourage foreign investments and collaboration as well.

Infrastructure and Environment of Ease

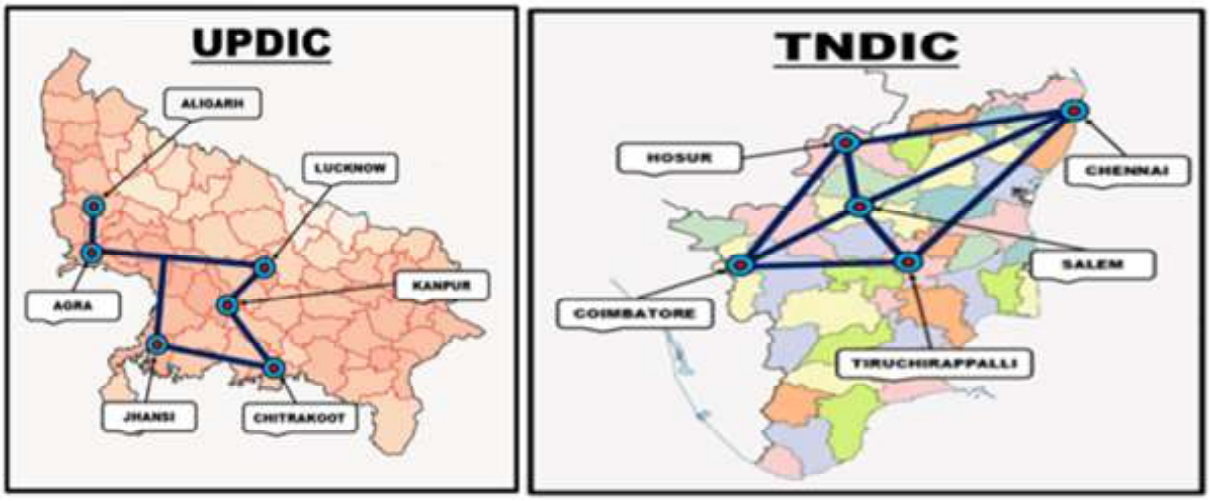
The Defence Procurement Procedure (DPP) envisions establishing long-term strategic partnerships with Indian entities through a transparent and competitive process, wherein they would collaborate with global Original Equipment Manufacturers (OEMs) to pursue technology transfers for setting up domestic manufacturing infrastructure and supply chains. This can significantly boost the manufacture of submarines, aircraft, helicopters, and armoured vehicles and is a step in the right direction. Initiatives like IDEX, ie Ideas for Defence Excellence, launched in 2018, also hold enormous potential by integrating Startups, MSMEs, R&D establishments, innovators, and academia into the defence ecosystem while providing them grants, funding, and other support.

A number of policy reforms have been undertaken to achieve the objective of ease of doing business, including the integration of MSMEs and start-ups into the supply chain. There has been almost a 200 per cent increase in the number of defence licenses issued to industries in the last 7-8 years. An indigenisation portal, SRIJAN, has been launched to facilitate Indian industry's indigenisation. The notification of four 'Positive Indigenisation Lists' totalling 411 items of services and three 'Positive Indigenisation Lists' comprising 3,738 items from Defence Public Sector Undertakings (DPSUs), for which there will be an embargo on imports beyond the timelines indicated against them[11], are prominent steps to promote indigenisation.

However, there is a perceived need for a centralised agency to formulate, coordinate, and monitor the R&D and production of defence systems in India. Currently, R&D and technology development are fragmented, with the defence forces creating a wish list through the Long-Term Perspective Plan (LTPP), the DPSUs framing the Technology Perspective Capability Roadmap (TPCR), and the DRDO developing the Long-Term Integrated Perspective Plan (LTIPP) based on the Services' requirements. No single agency exists to coordinate and integrate these plans. An institutionalized arrangement, in the form of a Central Agency, needs to be established, comprising members from the Services, DRDO, Ministries of Defence and Science & Technology, PSUs, Private Industry, Scientists, Academia, and Business Chambers. This Agency should continuously gather all inputs, requirements, technological capabilities, gaps, and opportunities. The Services' LTPP should then be thoroughly discussed by the Agency's Board Members while formulating a five-year plan with a firm, prioritised budget and timelines.

Expansion and Realignment of Defence Industrial Corridors

Establishing two Defence Industrial Corridors (DICS) in UP and Tamil Nadu, announced in 2018-19, has been a step in the right direction. These corridors aim to attract foreign investments, for which the respective state Governments have also published defence and aerospace policies. In Uttar Pradesh, the six DIC nodes are in Agra, Aligarh, Chitrakoot, Jhansi, Kanpur, and Lucknow, while Tamil Nadu has nodes in Chennai, Coimbatore, Hosur, Salem, and Tiruchirapalli. Perhaps more such corridors can be set up in industrialised states



like Maharashtra and Gujarat. What is also important is that single-window clearances are facilitated, licensing is simplified (with validity already increased from 3 to 15 years), more parts are delicensed for manufacturing, and the regulatory mechanism is eased.

Currently, the UP DIC has notified[12] proposed projects in Arms, Ammunition, Land Systems, Unmanned Aerial Systems, Small Arms, Metal Works, Electronics, etc., while land acquisitions for these initiatives are in progress. MOUs have also been signed with many domestic agencies, mainly PSUs and academia. Similarly, the TN DIC intends to establish an Avionics Manufacturing Centre, Testing Facilities, and Centres of Excellence, along with R&D Centres[13].

The concept of DICs needs to be deepened, as more DICs emerge in other industrialised states. The DICs also need to be realigned, revamped, and focused on bridging existing technology gaps in various types of weapon systems and platforms in an integrated manner, rather than following the current fragmented approach based on whichever entity is interested in establishing manufacturing facilities. To elaborate, each node in the industrial corridors should be designated to develop a complete R&D and manufacturing ecosystem for a particular piece of equipment or subsystem of a major weapon platform. For example, one or more complementary nodes can be designated for designing, developing, and manufacturing power packs for armoured vehicles, including the engine, transmission, fuel system, control systems, and the entire range of material technology and associated subsystems. Similarly, other nodes, preferably within the same DIC, should be earmarked for the armoured vehicles' armament module, fire control systems, and survivability module.

Similarly, the design and development of UAVs, artillery gun systems, missiles and rockets, futuristic sixth generation fighter aircrafts and many other such critical war fighting assets need to be taken up in various complimentary nodes in DICs where private sector, DPSUs, foreign OEMs (where required) and MSMEs are all equally essential stakeholders in developing an integrated ecosystem promoted by the government with clear objectives, timelines and funding support.

International Markets and the "Index of Atma Nirbharta"

India is steadily increasing its domestic defence manufacturing capabilities while boosting hardware exports to friendly foreign countries. It is now ranked among the top 25 countries in defence exports, with the export figure reaching Rs 23,622 crore[14] in FY 2024-25. The private sector and DPSUs contributed Rs 15,233 crore and Rs 8,389 crore, respectively, to these exports. The export figure has increased 34 times since 2013-14. Notable export deals include the supply of 155 mm artillery guns and Teevra 40 mm guns to the Indonesian Navy. There is a $ 250 million contract to supply Pinaka missiles to Armenia. India is also finalising missile deals with Indonesia, following the $ 375 million Brahmos missile agreement signed with the Philippines last year. As part of foreign collaborations, India will manufacture aero structures for Boeing's AH-64 Apache helicopters and has a deal with Airbus Defence and Space to produce C-295 medium-lift transport aircraft. During the PM's visit to the US in 2023, there was an announcement that 31 Predator 9 QB drones would be procured, accompanied by establishing a global MRO setup in India, which will herald exports in the future.

In fact, the arms deal in the international market is also an important indicator of the degree of self-reliance a nation has achieved in the realm of defence. As of now, there is no reliable way to determine the overall degree of indigenisation in defence since each indigenously manufactured system may have a number of imported components. A simpler way to determine the **Index of Atmanirbharta in Defence** could be by comparing the ratio between the export and import of defence equipment. As an illustration, the Indian arms exports in 2022-23 were 15920 crore, while imports were Rs 40,840 crore as per the Minister of State for Defence. However, if the figure is based on the SIPRI report of global arms trade of $112 billion and India's share as 11%, the import would be Rs 100 lakh crore. Depending on which figure is taken, the index of Atma Nirbharta would be between 0.16 and 0.39. Of course, it is expected to improve due to the emphasis on local manufacturing and exports.

Change in Mindset

It is felt that no amount of R&D or policy focus would lead to desired outcomes in defence manufacturing unless it is accompanied by a significant change in mindset, especially regarding the functioning of DPSUs. Lessons can be drawn from the case studies of Project ARJUN (initiated in the 1970s) and the Light Combat Aircraft (LCA) program (1980s). Both have experienced significant cost and time overruns, despite having considerable imported content. For ARJUN, due to the high cost of the imported mobility pack and the lack of economies of scale, the backup for spares and thus the maintenance of the limited inventory has become problematic. As for the LCA, the first GE-404 jet engines have just arrived after an inordinate delay, while GE-414 engines still lie in the future horizon following the GE-HAL deal. The ALH Dhruva program has also faced safety-related issues and delays in the setup of MRO facilities by HAL.

The planners for any futuristic weapon system or platform must also refrain from formulating an eclectic mix of qualitative requirements. Perhaps no weapon system or equipment in the world is best in class across all possible parameters. Thus,

the focus should be on an optimal mix of technical specifications to present a realistic design challenge to the developing agency.

Next, the developing agency should perform a SWOT analysis of the challenges in design and manufacturing. Technologies for which adequate indigenous capability is not available, that require large capital investments, and are time-intensive should not be targeted for local design and development. Instead, joint ventures with foreign OEMs should be encouraged, with outright import being the last option. It should be recognised that no nation can ever be 100% self-reliant in all state-of-the-art technologies, given the rapidly changing operational landscape and disruptive technologies. Even if technological capability exists, if economies of scale are not favourable, it may be better to join global supply chains (even in the era of Tariff Tantrum disruptions), the sooner, the better.

The private sector must be encouraged and provided with a level playing field. Transfer of Technology (ToTs) available with PSUs, whenever feasible, should be transferred free of cost to private sector manufacturers. The monopolistic situation where only a DPSU has a role needs to be curbed. For example, L&T, which already supplies crucial aircraft components to HAL, including wings and fuselage sections, can be encouraged to transition to full-scale aircraft assembly. This will not only address the production capacity limitations of HAL but also enable L&T to partner with HAL in the Advanced Medium Combat Aircraft (AMCA) program targeted for fruition by 2035. The induction of the Advanced Towed Artillery Gun System (ATAGS), designed and developed by DRDO in collaboration with Bharat Forge and Tata Advanced Systems Ltd, is a model to be followed. Handholding by the government, especially for MSMEs, is also imperative. Unlike the FICV program, which started in 2006 and closed 15 years later, where the big industry would have absorbed losses but MSMEs would have been devastated, this should not happen again.

Conclusion

Self-reliance in defence manufacturing is a strategic imperative for India. As a regional Indo-Pacific power, India's dependence on imports represents a critical vulnerability. Although India's defence manufacturing is poised on the cusp of transformation, it has a long journey ahead before it can achieve self-reliance. Many past impediments that hindered progress are now being addressed. The government has set ambitious targets for indigenisation, and its recent policies aim to revitalise this sector with a focus on innovation, technology development, exports, enhancing existing capacity, and improving efficiencies in defence manufacturing.

The entry of the private sector also bodes well for the future. However, there are still areas where the pace of change could be accelerated. A much greater focus on R&D, along with the reinvigoration and realignment of DICs to bridge the significant technology gaps, is essential. The endeavour of both the public and private sectors must shift from Transfer of Technology (which has yielded subpar outcomes) to Absorption of Technology. Additionally, there is a need for a centralised agency to formulate, coordinate, and monitor R&D and the production of defence systems in India. The extension of the Production Linked Incentive Scheme to carefully chosen defence manufacturing sectors will also help.

The emergence of India as a defence manufacturing hub, not only to meet its own security requirements but also for the entire region, will depend on the nation's ability and willingness to ensure that its progressive policies are implemented in both letter and spirit. Only after the simultaneous success of all listed initiatives can defence manufacturing firmly place itself in the fast lane and march towards self-reliance. This will be an arduous journey, and it has just begun.

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From Kerala to Bengal: The Expanding Web of Islamist Radicalisation in India and the Role of Global Jihadist Networks

Raja Muneeb*

Introduction

Kerala, once celebrated for its secularism and social harmony, is now facing a severe national security threat due to rising Islamist radicalisation. Once marked by literacy and communal peace, the state has become a significant hub for extremist activity in India, with links extending to Pakistan's ISI and terror financing networks in West Asia, Gulf countries, and Bangladesh. This report examines the rise of radical Islamic organisations in Kerala, especially the Popular Front of India (PFI), their role in spreading extremist ideologies, and the growing influence of such networks in other states like West Bengal.

The Popular Front of India (PFI): Origins and Ideological Foundations

Throughout the 1990s, the violent political tactics of mainstream Left parties, particularly in the districts of Kannur, Malappuram, and Kasaragod, as well as their surrounding areas, sparked religious polarisation in Kerala. The frequent violence perpetrated by the political workers of the Left party (LDF Front) led to the rise of extremist right Islamic organisations. The Naddapuram Defence Forum, commonly known as the National Defence Force (NDF), emerged as a local Muslim rights party and quickly gained significant support among Muslim communities that had suffered the brunt of the violence in Kerala. NDF managed to establish a substantial presence by recruiting from a large pool of vulnerable Muslim youth. The ensuing political climate facilitated the activities of Islamic political organisations, further exacerbating the radical and extremist agenda.

Kerala's transformation into a hotspot for radical Islamist activity is neither sudden nor isolated. Over the years, Islamist organisations, ranging from Jamaat-e-Islami to the banned Students Islamic Movement of India (SIMI), to NDF, and the Peoples Democratic Party (PDP) led by Islamic cleric Abdul Nazer Mahdani, along with other smaller parties, have proliferated and created an ideological ecosystem that laid the foundation for groups like the Popular Front of India (PFI) to thrive.

The now-banned PFI, formed in 2006 through the merger of three radical organisations- the National Development Front (NDF) in Kerala, Manitha Neethi Pasarai (MNP) in Tamil Nadu, and the Karnataka Forum for Dignity (KFD)- is perhaps the most influential and dangerous Islamist organisation that operated in South India. Its stated objective is to resist the rise of Hindu nationalist politics in India, but beneath this veneer lies a deeper agenda of Islamisation and ideological warfare. The National Investigative Agency (NIA), in one

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of its charge sheets filed in 2022, has mentioned that PFI aimed to establish Shariah-based Islamic rule in India by the year 2047 through various subversive means, including political subversion.

PFI's roots are closely linked to SIMI, a proscribed terrorist organisation that birthed another proscribed terrorist organisation, the Indian Mujahideen (IM). Many of PFI's founding members were SIMI operatives, including EM Abdul Rahiman (former SIMI general secretary), E Aboobacker (SIMI's Kerala chief), and P Koya, who was instrumental in building both SIMI and NDF. These individuals carried forward SIMI's legacy of militant Islamism under a new brand.

The PFI's hierarchical and cell-based structure allows decentralised decision-making while maintaining ideological cohesion. Through its affiliates, including the Social Democratic Party of India (SDPI), Campus Front of India (CFI), National Women's Front (NWF), and NGOs like Rehab India Foundation, it has established a grassroots presence across 22 Indian states. PFI cadres are known to mobilise in slums, urban centres, educational institutions, and mosques, promoting their agenda under the guise of legal aid, charity, and social work.

This effort has created a comprehensive socio-political network that can penetrate all layers of Muslim society. On the surface, these units advocate for civil rights, legal aid, and educational equity, but deeper investigations revealed that this was merely a façade to conceal more radical agendas.

Radicalisation and Recruitment:

The PFI and its political wing, the SDPI, employ a sophisticated strategy to radicalise disenfranchised Muslim youth. Drawing on Salafi-Wahhabi ideology, they utilise religious and political narratives to spread extremist views across slums, campuses, urban centres, and rural districts. Though inspired by Salafi beliefs, the PFI recruits from diverse Islamic sects, uniting them under the vision of an Islamic Caliphate governed by Sharia.

PFI runs parallel ideological movements in colleges and rural societies, promoting anti-democratic narratives by equating constitutional democracy with *kufr* (apostasy). A former ISIS recruit from Kerala revealed continued allegiance to ISIS ideology despite de-radicalisation programs, citing indoctrination through encrypted platforms by Gulf-based Salafi clerics.

The remote village of Attakad in Kerala showcases the deep roots of Salafi radicalism. Influenced by Yemeni ideology similar to that of the Houthis and ISIS, it attracted a Sri Lankan cleric linked to the 2019 Easter bombings, who recruited locals for ISIS. Although many families fled, extremist beliefs persist. PFI's links to global jihadist movements are well documented. Members have been arrested for ISIS recruitment and terror training camps, with ties to ISKP, AQIS, and incidents like the Bengaluru café blast.

Key Radicalisation Channels

a) Digital and Religious Literature: Radical content circulates widely, both online and offline, primarily through social media platforms like Facebook. Gulf-based pages promote Salafi ideology, particularly regarding Sharia compliance in business and society. Institutions that advance Sharia research further reinforce exclusivist thinking.

b) Travel to Conflict Zones: Dozens from Kerala have joined ISIS in Syria, Iraq, and

Afghanistan, often referred to locally as *Mujahids*, indicating tacit approval within segments of the community.

c) Unregulated Madrassas: Many Salafi-oriented madrassas recruit impoverished youth from across India. These institutions promote narrow interpretations of Islam and are linked to Tablighi and Dawah movements, particularly in sensitive states like Assam and J&K.

d) Goal of Islamic State: PFI and its affiliates aim to establish an Islamic state. They receive funding from Gulf sources through hawala and gold smuggling, targeting Dalits, Christians, and disillusioned youth for religious conversion. Satyasarini, PFI's educational arm, plays a central role in these efforts, claiming over 3,000 conversions. It preaches strict Salafism and sends recruits abroad for further radical training, with some joining ISIS. Their women's wing actively conducts college campaigns and provides legal and financial support for converts.

e) Diaspora Influence: Kerala's significant Gulf diaspora frequently brings back radical ideologies, intensifying sectarian divides and supporting recruitment efforts.

f) Campus Radicalisation: SDPI's student wing has influenced students in professional colleges, leading some to leave due to perceived Sharia violations in co-ed education. The extent of this issue remains unclear due to underreporting.

g) Islamic Education Networks: Figures like M.M. Akbar (dubbed the "Zakir Naik of Kerala") run schools that promote Salafi exclusivity. His Peace International Schools have been flagged for communal teachings. Akbar maintains connections with Gulf-based extremists and the Muslim Brotherhood.

International Ties and Gulf Networks

One of the most insidious aspects of PFI's operations is its connection to international jihadist networks through the Gulf. Handlers based in Qatar, the UAE, and Turkey play a crucial role in the radicalisation process. The organisation has developed strong ties with international Islamist groups, notably those linked to the Muslim Brotherhood and organisations in Turkey and Qatar. Some PFI leaders have maintained connections with clerics associated with Jabhat al-Nusra, now commonly known as Hayat Tahrir al-Sham (HTS), a former Al-Qaeda affiliate in Syria. The now-deceased Aijaz Ahangar, former chief of the Islamic State Khorasan Province (ISKP), was responsible for recruiting approximately a hundred Malayali Muslims into the global Islamic State (ISIS) network through his networks operating out of Qatar and Turkey. This trend of recruitment continues, with ISKP now maintaining a separate Malayalam wing for propaganda and recruitment based in Qatar.

These handlers, often affiliated with the Muslim Brotherhood or other extremist Islamist organisations, preach extremism via encrypted communication and disseminate religious discourses through social media. As mentioned by another former ISIS recruit from Kerala, who during his interrogation confessed that his radicalisation was facilitated online by a Qatar-based handler, he was introduced to purist Salafi Islam and radical interpretations of jihad and Shariah.

According to him, the ideology promoted in these interactions emphasises that democracy is "Kufr" (disbelief) and that Muslims must reject secular democratic governance methods in favour

of establishing an Islamic state. This ideology deeply resonates with the PFI's narrative and enables radicalisation at a deep and persistent level.

Political Penetration and Societal Impact

Though PFI was banned in 2022, its political wing, SDPI, continues to operate freely and spread radicalism. Many former PFI cadres have shifted to SDPI, thus maintaining their ideological mission under a political banner. While overt activities have slowed, their grassroots penetration remains strong. According to some analysts, SDPI utilises democratic platforms not for mainstream political purposes but to spread radical ideologies and assert a Pan-Islamic identity.

SDPI/PFI's social impact of its preaching has led to glaring visible changes in Kerala. The construction of mosques in Arabian architecture, adopting the Arabic language, and using Arabic as signage on shops and other establishments in Muslim-dominated areas reflect a profound cultural transformation, referred to by many as the "Arabisation" of Kerala's Muslim community. This shift is driven by massive Gulf remittances, which fund lifestyles, religious institutions, education, and political mobilisation.

The widespread adoption of Arabic customs and dress codes among youth has culturally alienated Keralite Muslims from Indian traditions. This growing obsession with Arab culture is one of the key enablers of radical Islamist narratives, making it easier for organisations like PFI/SDPI to claim authenticity and divine authority in their calls for Sharia and Islamic governance. While Kerala's traditional Muslim ethos was rooted in Indian pluralism, the rising influence of Arabic/ Gulf-influenced Islamist culture has created a societal rupture.

Role of Other Organisations and Resistance from Within

Kerala's mainstream Muslim organisations have largely distanced themselves from the PFI. The Muslim Coordination Committee, led by the Indian Union Muslim League (IUML), has excluded PFI/SDPI from its fold. However, they are now being compelled to adopt the same extremist political rhetoric for political relevance. The IUML and other Sunni factions have opposed PFI's ideological extremism and rejected its political vision. However, other Islamic political organisations have been less vocal, partly due to shared ideological spaces with PFI or their reluctance to alienate their voter base. Conversely, institutions like the Muslim Educational Society (MES) and JDT Islam represent a promising counterbalance. These secular Muslim organisations promote modern education and pluralistic values, providing an alternative to madrassas and Islamic seminaries.

The ISI Connection: Pakistan's Covert War

Pakistan's ISI has played a pivotal role in promoting radicalisation in India, using Bangladesh and Middle Eastern/ Gulf countries as proxies. The ISI maintains strong ties with Al-Qaeda, ISIS, Hizb ut-Tahrir (HuT), and ABT. Through these organisations, it seeks to exploit India's communal fault lines and destabilise internal security.

In Kerala, ISI's influence is channelled through Gulf-based networks. Radical clerics funded by Pakistan-backed NGOs preach Salafist doctrine

and provide logistical support to Islamist cells in India. In West Bengal, the ISI operates via Bangladesh, using JMB and ABT as conduits. These groups are involved in counterfeit currency rackets, human trafficking, and arms/narcotics smuggling, all under the ISI's strategic umbrella.

The ISI's relationship with global jihadist organisations is symbiotic. For example:

- Al-Qaeda: Pakistan has sheltered Al-Qaeda leaders for years; AQIS now directly targets India.
- ISIS: ISI-supported handlers in the Gulf facilitate recruitment from Kerala and Kashmir.
- HuT: Hizb ut-Tahrir is used as a radicalisation tool in educational campuses and mosques/madrassas.
- ABT operates under ISI's patronage from Bangladesh and is responsible for cross-border infiltration into Assam, Tripura, Jharkhand, Bihar, and West Bengal.

The Expanding Web of Radicalisation

Kerala's descent into Islamist radicalisation is not an isolated event but part of a larger pattern of ideological warfare against the Indian state. The PFI may be banned, but its ideology persists through the SDPI and affiliated networks. The Islamist radicalisation that began in Kerala has now spread across multiple Indian states, with West Bengal emerging as a significant new frontier. In West Bengal, the PFI made inroads around 2017-18, establishing sleeper cells and mobilising youth in Muslim-majority areas. In districts like Murshidabad, Nadia, and Malda, the indoctrination patterns followed the Kerala model, emphasising madrassa setups, campus radicalisation, Islamic identity politics, and the denouncement of Indian democracy as Kufr (apostasy).

Radicalisation is taking root along the porous border with Bangladesh. Islamist groups like Ansarullah Bangla Team (ABT), Hizb-ut-Tehrir (HuT), and Jamaat-ul-Mujahideen Bangladesh (JMB) have found safe havens in Bengal's border districts. These organisations share ideological and operational linkages with PFI/SDPI and benefit from cross-border movement, human trafficking, and the smuggling of arms and narcotics.

The ideological and operational links between Kerala's PFI networks and Bengal's radical fringe, enabled by ISI through the Gulf and Bangladesh, pose a serious threat to India's national security. Despite the ban on PFI, the battle is far from over. Radicalised students, Gulf returnees, and trained operatives continue to operate under various organisational disguises.

The situation in West Bengal is particularly alarming. Its proximity to Bangladesh and a history of neglected border security have allowed Islamist outfits, supported by both state and non-state actors from Pakistan, to establish operational bases. These groups are directly linked to the ideological seeds planted in Kerala and, in some cases, nurtured by extremist currents from the Gulf. The challenge is worsened by a cultural Arabisation that continues to disconnect Indian Muslims from their indigenous roots.

Countermeasures to Dismantle the Radicalisation Web

A comprehensive national policy is needed to address the rising radicalisation. Some immediate countermeasures that can be applied are listed as follows:

- First, secular educational organisations in Kerala, such as the Muslim Educational Society (MES) and JDT Islam, must be promoted aggressively. These institutions are inclusive, modern, and culturally Indian, offering an effective alternative to radical madrassas. They can serve as a powerful force in countering radicalisation through education.
- Second, a central monitoring cell with branches in each of the affected states must be institutionalised. This cell must be dedicated to tracking and debunking misinformation, extremist content, and digital jihadist propaganda. Social media platforms and encrypted apps must also be under constant surveillance in coordination with state police and intelligence agencies.
- Third, genuine intra-faith and interfaith dialogues must be encouraged to amplify the voices of moderate, reformist, and free-thinking Muslims. These conversations are currently absent in most parts of the country, particularly in Kerala and West Bengal, leaving the field open for radical ideologues.
- Fourth, diplomatic pressure should be exerted to minimise West Asia/Gulf-based funding. Additionally, engaging the Gulf countries diplomatically can help identify and curb ISI-related networks targeting Indian nationals.
- Finally, any Islamist political outfit, such as the SDPI, operating under a democratic smokescreen must be strictly monitored. Political legitimacy must not be allowed to become a license for subversive radicalisation.

Conclusion: A Policy Vacuum Amid a Brewing Storm

Kerala's tryst with radical Islamism is no longer hypothetical; it is real, deep-rooted, and increasingly transnational. The fight against radical Islamism is as much about ideology as it is about national security. Unless India addresses the socio-political ecosystem that enables radicalisation, especially in Kerala and West Bengal, the threat will continue to metastasise. The ideological battlefield is not in the forests or foreign war zones but in urban campuses, small-town mosques, social media platforms, WhatsApp, and other chat groups. A policy vacuum compounds the challenge. Radical elements also exploit the absence of counter-narratives, particularly among isolated and confused Muslim youth.

In an era where asymmetric warfare and ideological insurgency define global threats, India must not underestimate the dangers posed by Indian-born, ISI-enabled, and Gulf-financed radical Islamist networks. Unless we act now, the next wave of radicalised youth will emerge not from the war-torn West Asia but from our very own southern and eastern heartlands. This battle against radicalisation must be fought vigorously to protect the soul of the Indian ethos. A strong national strategy or a policy for counter-radicalisation measures is the only answer to push away this threat that is now looming large in our country.

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Viksit Bharat @2047: The Challenges Ahead
An Interview with Shri Ashok Malik

Rami Desai*

Rami Desai: To achieve the goals of becoming a developed nation, or Viksit Bharat, by 2047, there are numerous markers to consider, such as technology and social cohesion. We have witnessed significant disruption in recent years. Let me pose the first question that comes to my mind: social cohesion, which is crucial for a developed country. There has been considerable discussion and concern regarding illegal immigration into the country. Reports indicate that there are approximately 20 million illegal immigrants in India, many of whom are connected through vast and complex networks involving anti-India elements, including terrorist organisations and groups like the Rohingya. How do you think India can address the issue of illegal immigration? Additionally, how can it safeguard itself from these existing networks?

Ashok Malik: This calls for something more than a simple, better border-patrolling answer. If you consider Bharat or India as a civilisation, we are going through the post-1947 or post-1950 phase. For instance, a vast ancient civilisation with a lot of ambiguity in its frontiers is crystallising into a modern nation-state. It's not an easy process; it's a challenging process. For example, fairly open borders with migrants coming in, not sometimes as invaders- I appreciate that- but much more often as traders, as migrants, as pilgrims, back and forth. This has been a part of our history. Obviously, this is not sustainable in a modern 21st-century environment. It needs to be curbed to a necessary degree. However, India is also the biggest economy, the biggest country, the biggest magnet in the Indian subcontinent- or what some people prefer to call South Asia; I prefer calling it the Indian subcontinent. As such, not integration, but inter-linkages with our neighbouring countries, whether social, cultural, or economic, are making them part of the broader Indian economy.

As a mechanism to enhance connectivity, which benefits us as well, especially if you consider

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the states of the Northeast, access does come through border countries, for instance. Someday, if Pakistan sorts out its terrorism problem, regular economic exchanges with Pakistan could benefit our state of Punjab. Of course, I don't see that happening right now. But what we need to do, what we are trying to achieve, is solidifying our borders, crystallising them, which have not been clearly defined for thousands of years. Still, this is in the context of the modern Indian nation-state. We must secure our borders, curb illegal immigration, while incentivising legal immigration that meets genuine economic and labour needs in our country. All of these processes have to work in parallel. It's complex; it's not easy. India can't afford an open border, nor can it sustain a completely closed system like the Great Wall of India. There is a halfway house which we will have to live in for our own needs and gains. This involves negotiation between India and its neighbours, and a frank discussion we must have with ourselves. What are the metrics or parameters for how much we open and how much we do not? This varies from border to border, neighbouring country to neighbouring country, and region to region. There is no one-size-fits-all answer. Thus, the perspectives on frontiers from Delhi and those from the ground are very different.

Rami Desai: But you speak about the borders, and we know that we have some of the largest porous borders any country has. We are also surrounded by countries that are, to say the very least, in flux. Recent developments on our northeastern borders have revealed a complicated relationship regarding whether we should shut it down and what the process should be. Considering that we have made significant progress in developing infrastructure in these areas, how do you envision safeguarding our borders?

Ashok Malik: Look, infrastructure at our borders is something we have ignored and neglected for years. We adopted a defensive posture, arguing that we couldn't afford to improve it because it was exceedingly difficult and logistically impossible. Transporting construction materials to the border was also much more challenging, and we believed it would incentivise invading armies, reflecting a very defensive strategy. Over the past 10 years, one of the outstanding achievements of the Modi government has been the significant upgrading of border infrastructure, which is necessary and has occasionally caused other countries to feel more alarmed than they should have. This is particularly relevant given that countries like China have constructed much greater infrastructure over a more extended period. However, this is important not only for military posture but also for integrating our Indian communities and citizens living in border regions with the rest of the economy. This integration is crucial; otherwise, they remain in an isolated limbo. There is a challenge in Bangladesh today that requires a tough stance, but we have also achieved much with Bangladesh under previous governments. Our relationship with Nepal is somewhat inconsistent, but there have been achievements. There have also been successes with Bhutan. Regarding the Maldives and Sri Lanka, circumstances are looking better today.

Given all of this, I realise I am discussing sea borders as well as land borders. With all of this infrastructure at our borders to build connectivity,

enabling commerce, promoting economic interchange, and incentivising countries and societies to live peacefully and equitably with India. Because if the economic stakes for a good relationship with India are significant, then the willingness to allow their politicians to act recklessly will be much more limited. For a country like India to deal with this neighbourhood, there is a combination of the Iron Fist and the Velvet Glove. Coercion is needed when it's necessary. Absolutely, like right now in Bangladesh, considering what is happening and the fact that Bangladesh is being unfair to its minorities, which immediately impacts India socially, and given that Bangladesh is flirting with Pakistan and China, we must take a tough stance, and we have done so. I suspect it will get tougher.

On the other hand, where the environment is more welcoming, as it is currently in Sri Lanka, we should incentivise a close relationship. If that means enhancing border infrastructure or connectivity corridors, we should do so. Thus, there is no one answer for all countries in the region, and there is no single solution for any one country over time either. It changes with the posture of other countries.

Rami Desai: Correct. But what interests me is that while we talk about these other countries and what we should be doing with them, taking a tough stance when necessary, as we have done, we have also faced repercussions in terms of major international powers. Whether it's cross-border issues or internal matters, major powers want to counter a rising India and an assertive India. We have seen this during the farmers' protest, CAA, and so on. Why do you think this happens, and how should we react to it?

Ashok Malik: The world doesn't owe you a living. If you are a rising power, you will face challenges, even from friends who want you to rise only to a certain point. That's how it is in an office environment. That's how it is in the ruthless world of global politics. You have to secure your interests. You have to protect your core priorities, which are non-negotiable. We are moving towards a world where they say spheres of influence are re-emerging as a concept, in contrast to globalisation, which created a flatter world. I don't know whether this is true because I don't want to make a prediction too early in the process, but assuming it is even halfway true, we need much greater influence and control in our neighbourhood. If that requires confronting even larger powers from outside the region, or those who may be friendly with us in other areas, we should be willing to do that. A former American Secretary of State at a conference in India a couple of years ago said we can walk and chew gum at the same time; if the Americans can do it, so can Indians. You can have Bhelpuri and walk at the same time.

Rami Desai: Absolutely, I agree, especially with the Bhelpuri. But you know, we have also made considerable advances in digitisation. That has been one of our fantastic success stories, and this government has put our digitisation story on the map. However, this also brings about some vulnerabilities that can be exploited in our weaker moments. What do you think those challenges are? How should we approach them over the next 22 years?

Ashok Malik: This is a good point you raised because, if you ask me what my nightmare security

scenario for the proximate future is, much more than a nuclear attack, it is possibly a devastating cyber-attack that cripples our financial systems. The whole concept of what is considered critical infrastructure for our country has changed. In the old days, critical infrastructure may have included places like Bombay High or steel plants. We have four or five legacy steel plants in both the private and public sectors, which are iconic, along with other industrial facilities. However, the definition of critical infrastructure today has expanded to include our digital backbone—undersea cables, for instance, of which we are part of a global consortium. Separately, in our use and adoption of the Internet, whether through social media or email, we are also vulnerable to manipulation, just like other countries. I am not saying we are the only ones. Given how rapidly and impressively we have digitised, many countries in the Global South are looking at aspects of India's digitisation. They may not want the entire India Stack, but they seek parts of it, whatever suits their needs.

It is essential for us to be at the forefront of cybersecurity. I would assert that our global partnerships, be they with European countries, France, or the US, particularly in the area of cybersecurity through the collaboration of many Indian tech professionals and cybersecurity workers in the Indo-US tech corridor, hold great promise. At the most basic level, all our public and private institutions need to invest more and more wisely in cybersecurity. Some years ago, we experienced a cyber-attack on the AIIMS Delhi database, which is notably valuable. It contains patient records and extensive epidemiological data, yet insufficient care or consideration was given to its protection. I am not casting blame here, but this should act as a wake-up call. A crippling cyber-attack is my worst nightmare, far more troubling than a nuclear attack.

Rami Desai: Absolutely. I must agree with you regarding how dependent the common man is on our digital infrastructure. However, let me shift to technology as well. Some would say that we completely missed the industrial revolution bus and shouldn't miss the technology revolution bus. Whether AI, the semiconductor industry, or quantum computing, a certain amount of resources is needed. How can we compete with other countries? Where do you think we are lacking, and how quickly do we need to progress in this area?

Ashok Malik: We have more resources today than we did 20 years ago. I will explain what I mean by that. The other day, I was discussing this topic, which is slightly unrelated to your answer, but I will return to your answer shortly. I was talking about Hyundai, which raised money in India last year in what was India's largest IPO. Hyundai entered India in 1995. India's GDP at that point was about $400 billion because, in 1991, our GDP was $ 275 billion. So, I am assuming it grew to $ 400 billion by the mid-90s. Today, our GDP is $ 4 trillion. It is ten times larger. Simply put, more capital is available now, which is why Hyundai, once an investor that brought in money in the 1990s, is raising capital in India today.

Now, if you look at semiconductors, which is a vast and resource-intensive ecosystem- from chemicals and materials at the base to a fully-fledged fab at the top- we are currently at the 3rd or 4th echelon of a skyscraper. However, 20 months ago, we were not even at the

groundbreaking level; thus, we have made appreciable progress. There's much more to do. We have brought in technology from other countries, but much of the investment has actually come from Indian funds: Indian public money, Indian taxpayer money, and some Indian private money. Capital is undoubtedly needed, and I do not suggest that we don't need foreign investment. Of course, we do, especially for AI partnerships with global companies, all of whom want to test their models and have different approaches toward India or with India. We must allow them access and create workable relationships that benefit them and us.

That will bring in capital and investment. Money isn't as much of a problem- whether global or local- as deploying that money smartly. You are quite right about semiconductors, which are now seen as a metric of national security. We saw this during COVID when car waiting lists in India were up to a year. We need semiconductor legacy chips for the electronics and automobile industries, which is our focus. Quantum computing, although still emerging, is just around the corner, and we know it. Artificial intelligence, of course, has enormous social implications. It's not just about weaponisation; it can enable better lives for our farmers, students, and poor people in general, improving governance. A controversial suggestion here is that we need to integrate AI into our judicial proceedings. Instead of having one person go through copious documentation, how about using AI as a filter? I suspect it will be better than many want to believe.

Rami Desai: Do we need an overarching commission, like the Atomic Energy Commission?

Ashok Malik: For new technology, there are groups within the government that bring in private sector people as well, because much of the technology here lies with the working private sector. Our semiconductor mission, for instance, uses government personnel and private sector individuals, including people of Indian origin living abroad. The AI missions, similarly, are looking at a more inclusive collaborative formulation. We are hosting a big AI conference next year. I think early next year, February next year, if I'm not mistaken, which is also seen as AI for impact and inclusion. So, I don't think there is a need for one big technology commission, but each of these areas will require a collaborative process, and some of that is happening. Maybe it can happen better, but it's there.

Rami Desai: A nation like ours needs a robust defence sector. That would contribute to the assets we require to better achieve our goals by 2047. Do you think we are on the right track, or do you believe there are challenges ahead?

Ashok Malik: We are both on the right track and facing some challenges. It's like this: for many years, for various reasons- some of which were our doing and some not- we have had a dependency on Russia or the Soviet Union regarding our military platforms. We have now diversified. We obtain platforms from France; we have platforms from the US, of course, and we also get platforms from Israel. However, we do not want to replace one dependency with another. In the end, we will need to make ourselves. Of course, every country buys military platforms, defence equipment, or munitions, but we also want to establish at least a sufficient critical mass of our own. We aim to develop our

platforms, which we are starting to do with aircraft carriers, for instance, and advance up the value chain.

But no one will hand it to you on a platter, not even your best friend. They want to keep the crown jewels to themselves. For example, when you look at jet engine technology, we are collaborating with the Americans and the French. There is also some discussion about working with the British. No one is going to give you 100%. You will need to work with all of them, triangulate your efforts, and still face a gap you must fill yourself. A strong defence manufacturing sector, one of this government's main priorities, intersects significantly with a modern industrial economy. The two are interconnected – if you have a strong defence sector, you will have a manufacturing economy. If you possess a manufacturing economy, transitioning to defence manufacturing is natural and straightforward. The two are linked, and in a way, the defence manufacturing or the defence production, or the Atmanirbharta in defence initiative, will test how successful we are in boosting manufacturing indices in our country.

Rami Desai: Yes, we have achieved quite a bit, but there is still a little way further to go to achieve our goals by 2047. To make all of this happen, we need effective systems that include our bureaucracy. Are we on the right track, or do you feel that more lateral inclusions are required, where we can draw talent from subject experts?

Ashok Malik: I worked for five years in the government as a lateral entrant, and it was an enormous learning process for me. I think I managed to contribute somewhat; at least, I hope I did. That said, every country- whether it's the US or China- needs a permanent bureaucracy. I don't believe lateral entrants can replace permanent bureaucracy; they can complement it. They can come for short periods, three years, five years, or whatever, bringing their expertise and then moving on. They will move on because a career bureaucrat or civil servant thinks differently. I am not saying they think better or worse; they think differently, and that perspective is also needed in the system. Career bureaucrats are generally more cautious, and their training reflects that caution. Some of that caution is necessary, but sometimes it can become an end in itself, which is problematic.

Therefore, more people from outside should come in. I also believe that government employees should be allowed to transition to the private sector for a couple of years, as in many countries, mainly European countries.

Osmosis is meant to be two-way; otherwise, we produce two cultures that barely interact, which is not beneficial for the government or the private sector. There is an understanding gap regarding how each side makes decisions, their motivations, and those of the private sector and civil service. These are genuine motivations. It's not that I don't want to do something for the sake of avoiding it. For example, a decision was to be made during my first couple of months in government. I made a recommendation that seemed straightforward to me. However, I kept receiving questions repeatedly from my senior, and initially, I felt irritated. I wondered if he was trying to provoke me because I was an outsider. Eventually, I realised he was examining my decision to give every possible justification so no one down the line could question

it. I came to understand that he was teaching me. Should our system be so laborious that making a fairly straightforward decision takes so long? That is a fair question. Does our system need to be more cautious because it's taxpayer money compared to what might happen in the private sector or a foundation? That's also true. Therefore, there is no one answer. I also believe that the quality of ministers matters. Unfortunately, in India, the skills required to get elected to parliament and those needed to govern are increasingly divergent, posing a challenge.

Rami Desai: On that note, one can hope that, as you mentioned, this osmosis is essential for better functioning. I believe it would provide valuable insights to even the bureaucrats if they were allowed to experience the private sector, as there seems to be a cocooning within the bureaucracy. Thank you so much, Ashok ji, for being here and sharing this insider's view with us. You have been in the government and truly know this from an insider's perspective.

Ashok Malik: Absolutely. Thank you very much for having me.

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World in Transition: Building Resilience for India's National Security

Gautam Sen*

"A resilient society featuring democracy, trust in institutions, and sustainable development lies at the heart of a resilient state."

Global Strategy for the European Union's Foreign and Security Policy, 2016: 24

Introduction

Exploring the long-term threats to India's strategic autonomy[1] is crucial for the country. It entails understanding and institutionalising mechanisms to build resilience in 21st-century India and creating decision-making processes and rule-based participation by institutions and organisations in the Indian government, the private and corporate sectors, and NGOs, on an even playing field.

To build a specialised focus on resilience, an assessment[2] of the same in the Indian context would require an institutionalised network of multi-disciplinary skills. In the limited time, we decided to share the burden of ploughing through the strategic conundrum by uncovering the mosaic of "World in Transition"[3] In the first part, I will first give an overview as to what were the security challenges that were faced globally between 1945 and 2000 and identify how the world remained strictly bipolar till the demise of the former Soviet Union till 1991.

More painful was the period between 1992 and 2000. It made the monopoly of nuclear weapons, which had made the construct of superpower into a binary platform crumble and has made cyberspace become dominated by information technology[4]. The domination of information technology can be seen more clearly from 2001 to 2022. Therefore, the world or the global order between 1945 and 2000 can be dubbed the "World in Transition", and from 2001 onwards, it can be labelled the "Age of Uncertainty."

In the deliberation of this paper, the following issues will be covered:

1. Historical Overview of the Strategic Challenges of the 20th Century
2. Global Security Challenges Facing India in the 21st Century
3. Great Power Competition

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4. Recommendations

5. Conclusion

1. Historical Overview of the Strategic Challenges in the 20th Century

Nuclear weapons[5] have gained a reputation for providing deterrence in the execution of warfare strategies. Technology and foreign policy were intricately interrelated. Herman Kahn had written "Deadly Logic, " and Kissinger had perpetuated "Nuclear Weapons and Foreign Policy." MacArthur was the role model for every soldier in the Western world, while Mao and Ho Chi Minh served as role models for the developing societies of South and Southeast Asia. There were no takers for Lenin or Che Guevara. War was divided into two levels – conventional and nuclear. Strategic challenges underwent three distinct phases between 1945 and 2000.

WW II 1939 – 1945

The impact of technology[6] in conducting warfare was fully evident and expanded dramatically in air, land, sea, and underwater warfare. Technology decided policy making, unleashing the power of the Atom. The possible use of weapons of mass destruction became a reality, and the strategic challenge was to win the war.

Cold War: 1945-1991

Ideology takes centre stage as the liberal democratic form of governance operates with market forces and competes with centrally planned economies of socialist countries to establish bipolarity. Strategic analysis was based on privileged information, leading to a government monopoly in both systems. A significant reduction in the numerical manpower strength of Western armies focused on high-end technologies to incorporate nuclear weapons "sited for all round defence" through NATO's military alliance politics to protect Western Europe by creating a ring fence around the southern tier of the Soviet Union, which has a Muslim population, through SEATO and CENTO. West and East, represented by the US and the Soviet Union, prepared for three and a half wars at the height of the Cold War.

SALT-I, 1991; SALT-II, 1993; CTBT, 1996; PTBT (Partial Test Ban Treaty, 1963); NPT, July 1968, entered into force March 1970. A Review and Extension Conference was conducted in 1995, deciding that the Treaty should remain in force indefinitely. The ABM Treaty was concluded in May 1972. The Treaty on the Reduction and Limitation of Strategic Offensive Arms (START-I, 1991) initiated START-II in 1993 but did not come into force. Similarly, the Treaty on Conventional Armed Forces in Europe (CFE, 1990) was also implemented. Soviet revisionism during the Cold War period – from Stalin to Khrushchev to Gorbachev- ultimately led to the balkanisation of the Soviet Union in 1991. The proliferation of nuclear technology and nuclear weapons spread to other nation-states, resulting in a multipolar world.

Challenges during the Cold War[7] focused on avoiding nuclear holocaust and defining and limiting the periphery of deterrence, which explains the interplay between non-proliferation and proliferation doctrine.

Post Cold War: 1991-2000

What were the conceptual issues at stake? The central question revolved around whether a new world order was emerging.[8] Did this signify the collapse of the existing global agenda, prompted

by the disappearance of a permanent adversary and the dissolution of bipolarity following the fragmentation of the Soviet Union? Would this global transition mark the decline of the nation-state as the primary unit of international relations and political organisation? Could European integration lay the groundwork for a new supranational political architecture—a potential superstate? What would be the implications for key domains such as politics, economics, fiscal policy, monetary systems (including exchange rate mechanisms), migration, and environmental governance? And in this shifting landscape, does Europe assume the strategic and ideological role once held by the former Eastern Bloc?

What was Europe's vision for the world in this evolving order? In the context of the so-called *New World Order*, Europe was confronted with several transformative dynamics:

- The erosion of collective leadership
- The decline of state capitalism
- The intersection of technology and development
- The ethical challenges posed by technological innovation
- The potential retreat of the welfare state
- The rise of the individual as a political and economic actor
- Shifts in international political economy, including regime theory and transnationalism
- Redefinitions of the nation-state, society, and identity
- The impact of technology on transnational structures and governance

These conceptual shifts posed fundamental questions about Europe's role in shaping a new global paradigm.

2. Global Security Challenges facing India in the 21st Century

It is abundantly clear in 2022 that the notion of Russia and China integrating into the liberal international order is beyond imagination. Instead, we are witnessing the emergence of a new era of intensified great power competition in the global arena. This great power competition differs from that of the Cold War and the early 21st century, which saw the collapse of the Soviet Union and the rise of China as an economic and military power.

While the US has maintained its leadership as a superpower with its European allies and Japan, India has been emerging[9] as an important player in the global order with the fastest-growing economy, demonstrating potential for self-reliance and capacity building for resilience in non-military areas, such as containing the COVID pandemic.

While it is necessary to contemplate a world in which the United States and its allies compete with China and other autocratic regimes beneath the threshold of war, we cannot lose sight of the professed traditional mission of post-war U.S. strategy: to deter aggression by adversaries. This situation has also become more complicated as great power rivalry has intensified, along with the emergence of democratic powers like India coming to the centre stage of world events, contributing to a growing influence on world politics and becoming a leading actor in international political economy.

We often think of revisionist powers as countries determined to achieve global domination,

such as Nazi Germany or the Soviet Union. However, revisionism rarely manifests itself in the form of all-out war. Revisionist states typically target the non-vital interests of their great-power rivals, as this generally does not provoke the kind of retaliatory strike that attacking a vital interest would. Threatening non-vital interests—for example, by attacking a non-ally—leaves the status quo power uncertain about how to respond and whether retaliation is worth the effort.

Of course, the term "non-vital interest" is somewhat misleading. It only holds true when viewed narrowly and in isolation. While annexation and unprovoked invasion, like the case of Ukraine, clearly constitute a breach of the peace and threaten vital interests of nation states, seizing small rocks or strips of territory poses a more ambiguous threat. Such moves appear to be of limited strategic importance until, in the aggregate, they acquire much greater value. At the outset, the fact that no treaty has been breached and the territory seems to be of limited importance is highly significant to the dynamics and psychology of any given crisis. The small strategic value of the contested territory causes the dominant power to refrain from going to war at an extraordinary cost, which would be vastly and inversely proportionate to the value the dominant power places on the disputed territory.

This is not a new problem. It is textbook revisionism, which poses the most complex challenge that a major power can face. The purpose of revisionism is to make deterrence extremely difficult and to encourage rival great powers to accommodate them diplomatically or to limit their response to the point of being ineffective. While a regular security dilemma between two status quo powers can be addressed through reassurance and transparency, a revisionist power will not be satisfied with the restraint of others.

The most crucial piece of the post-war world order is not the United Nations or international financial institutions, important as they are. It is a healthy regional order. It is a truism to accept that America's greatest success after World War II was to create a system in Western Europe and Northeast Asia that ended German and Japanese imperialism and provided the basis for shared prosperity. One must accept as a realist that if those regional orders fall apart, so will the global order. For example, a war between China and Japan—the world's second and third largest economies- would have massive repercussions for the global economy. A Russian incursion into the Baltic, catalysed by the Ukraine crisis, would raise the risk of nuclear war between the world's two largest nuclear powers.

It should come as no surprise that China and Russia are regionally focused. After all, major powers are usually primarily concerned with their immediate environment rather than abstract notions of global leadership. However, the vulnerability of regional orders makes the global order vulnerable. If there is a significant challenge to the international order, it is most likely to occur at the regional level. This is why Russian and Chinese activities in their neighbourhoods are more reflective of their approaches to the international order than their explicit policy on global issues, although those are also important. Ultimately, a country's willingness to honour the norm against territorial conquest is much more important than its compliance with the dispute settlement mechanism of the World Trade Organisation or voting weights at the IMF.

3. Great Power Competition

The concept of global security[10] occupies a foremost position in the minds of international relations policymakers and government officials in most countries. However, maintaining global security holds significance primarily for the so-called 'great powers'. These powers can influence the international stage, change the lives of millions, and control the future. In his book 'The World after the Peace Conference', Toynbee describes the concept of a great power as "a political force exerting an effect coextensive with the widest range of the society in which it operates" (Toynbee, 1926).

In other words, a great power is a nation with sufficient scope to exert its influence and interests on the international stage successfully. In critiquing Toynbee, it is essential to argue that a power needs the necessary resources and political will to exert itself globally and to be recognised as a great power by other foreign states and societies. For example, today, Estonia cannot send troops to remote corners of the world or lead international coalitions at the United Nations due to its limited resources and incapacity. In contrast, the United Kingdom can. Metaphorically, it has a seat at the table, and other states acknowledge the ability of the United Kingdom to impose itself on the international stage, thereby establishing it as a global power.

In this context, it can be argued that great power competition among the great powers threatens global security by analysing three major global powers: the United States, Russia, and the People's Republic of China. Each of these countries can exert influence on both the international and domestic stages, which is in coherence with the critique of Toynbee. Unlike the United States, however, Russia and China aspire to 'steal' America's position as world hegemon. Their ambitions to become the undisputed world power are, for now, just aspirations. As long as the United States, whether in prosperity or decline, remains the world hegemon, the security threats posed by China or Russia will remain regionally constrained, thus not posing a menace to global security.

I would argue that Russia's position is not of significant international concern. The Russian threat, or what Westerners perceive it to be, is not the massive bogeyman it was in previous decades. With the Soviet Union dead, the Russian psyche must prioritise defence due to its considerable loss of perceived friendly territory. Moreover, with NATO's expansion into what Russia could perceive as its sphere of influence, the West risks igniting tensions that shouldn't exist. Perhaps the duality that Russia seems to embody only needs to be coaxed out to transform into a cooperative member of the European Community. A cooperative Russia would benefit both peace in Europe and global peace.

Lastly, when addressing great power competition that threatens global security, the role of China must be analysed. China has a rich and complex history and culture; from the Qin Empire to Xi Jinping, China's civilisation rivals even the greatest empires of Europe. As Kissinger argues in his book On China, the Chinese view themselves as having a national destiny to be not only the dominant power in Asia but also the world hegemon (Kissinger, 2012). With China's recent diplomatic overtures in the international arena, incursions into

the South China Sea (Sevastopulo, 2021), and threats against Taiwan (Patel, 2021), they, like Russia, are testing the will of the West – but more specifically that of the United States. However, some argue that China cannot, and can never, become the world hegemon due to economic failings and domestic crises.

Overall, China's ambitions to become the world hegemon are undoubtedly evident. The incursions into the South China Sea and the ambitions to overtake the United States as the largest economic power clearly indicate this desire. However, this aspiration will remain merely a dream as long as America remains the top dog. The world may face significant threats to its security in regional areas (India-China border, South China Sea, Korean Peninsula) due to China's pursuit of being number one. Still, as long as the United States can maintain its position, global security will remain intact.

4. Recommendations

India needs to enhance its competitiveness in relation to China and other authoritarian powers to acquire resilience and achieve strategic autonomy. In this regard, the following recommendations are made:

- Pursue military modernisation to continue reorienting India's defence policy toward addressing major power competitors. The United States must also incorporate initiatives that enhance strategic competitiveness while rebuilding the domestic economy after the pandemic. This includes a strategic approach to technological innovation and reducing the vulnerability of certain sectors of our society to interdependence with adversaries. Strategic thinking must be integrated across all relevant government agencies and departments.
- Next, competition with China should embody a positive and affirmative vision of the free world, which we would continuously work to strengthen and improve. This would include increasing the free world's resilience to pressure and shocks from authoritarian states; protecting democracy and the rule of law from illiberal forces; coordinating on technology policy; enhancing cooperation on transnational challenges such as climate change and global public health; and developing a suite of capabilities to shape the international order. It must also involve an ambitious and proactive effort to help free societies and like-minded partners recover from the pandemic, including in the developing world.
- Continue to deepen the Indo-US alliance and partnerships in the Indo-Pacific by focusing on deterrence through denial, enhancing the credibility and resilience of India's presence in the region, encouraging cooperation among allies and partners, assisting allies and partners in responding to external coercion and interference, deepening cooperation with the US, Japan, Australia, and Southeast Asian countries while balancing against China. The time has come to strengthen ties with Taiwan.
- Revise India's defence spending target to encourage European allies to invest in civilian and military capabilities, such as new

technologies, to help them compete with China.

- Facilitate a national conversation about the type of strategic competition India wants to engage in. Great power competition is not a strategy but a condition we must cope with in all its dimensions. We are still at a relatively early stage in identifying different competition strategies. Over the next ten years, India must refine and develop its thinking on the objectives of the competition and the means to accomplish these accordingly.

5. Conclusion

The idea that great power competition threatens global security is indisputable—history, particularly the horrors of the 20th century, serves as a stark reminder. However, such threats are considerably diminished in a unipolar world dominated by a single hegemon. Under American leadership, the international order has enjoyed relative stability; ideally, this influence will continue to serve as a cornerstone of global security.

While rival powers such as China and Russia may aspire to challenge or even supplant the United States as the dominant global force, such an outcome remains improbable. The current world order will likely endure as long as the U.S. maintains its strategic pragmatism—remaining more Machiavellian, if necessary, than its competitors—and preserves internal cohesion. In this context, American hegemony remains the most reliable guarantor of international stability for the foreseeable future.

Acknowledgement

While composing this position paper, I have not deviated from the research method by adding many essential footnotes. However, I would be remiss if I did not acknowledge the numerous writings of scholars and professionals in the field, US Congressional Research monographs, UN reports, and several independent papers on the subject. I have taken the liberty to quote and rearrange their thoughts to provide seamless output in this deliberation, which, to my knowledge, has not appeared thus far. I want to acknowledge all the authors whose work has enriched my understanding and assessment.

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2 *Fjäder, C. (2014). The nation-state, national security and resilience in the age of globalisation.* Resilience, 2*(2), 114–129.*

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3 *This aspect is discussed in the main text of this presentation as "Historical Overview of Strategic Challenges of the 20th Century and Global Security Challenges Facing India in the 21 st Century pp 7-10*

4 *Mallick, P. (2023).* Information, Cyber and Space Domain and Its Application in Future Land Warfare.

5 *For over 50 years, but especially since the end of the cold war, the United States and the Russian Federation (formerly the Soviet Union) have engaged in a series of bilateral arms control measures that have drastically reduced their strategic nuclear arsenals from a peak of around 60,000. The most recent of those measures, the New START Treaty, limits the number of deployed strategic nuclear weapons to 1,550 per State. New START is scheduled to expire on 5 February 2021; should it expire without a successor or not be extended, it will be the first time that the strategic arsenals of the United States and the Russian Federation have not been constrained since the 1970s.**

** The New START Treaty entered into effect on 5 February 2011 for a period of 10 years. It can be extended for up to five years, unless it is replaced earlier by another agreement.*

Source: Federation of American Scientists. Although nuclear weapons have only been used twice in warfare—in the bombings of Hiroshima and Nagasaki in 1945—about 13,400 reportedly remain in our world today and there have been over 2,000 nuclear tests conducted to date. Disarmament is the best protection against such dangers, but achieving this goal has been a tremendously difficult challenge. See https://www.un.org/disarmament/wmd/nuclear/

6 *In the long-term, nuclear weapons produce ionizing radiation, which kills or sickens those exposed, contaminates the environment, and has long-term health consequences, including cancer and genetic damage. Their widespread use in atmospheric testing has caused grave long-term consequences. See What happens if nuclear weapons are used? – ICAN https://www.icanw.org catastrophic_harm*

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9 *Anant, Hardeep. (2015). Challenges facing India in the 21st century: An HRD perspective. 13. 1367-1375 and Also see Siwach, R. S. (2003). India's Security in the 21st Century: Challenges, Management and Futuristic Directions.* Indian Journal of Asian Affairs, 16*(1/2), 145–158. http://www.jstor.org/stable/41960508*

10 *Global security includes military and diplomatic measures that nations and international organizations such as the United Nations and NATO take to ensure mutual safety and security. Global security, instead, has five dimensions that include human, environmental, national, transnational, and transcultural security,*

and therefore, global security and the security of any state or culture cannot be achieved without good governance at all levels that guarantees security through justice for all. Security, like peace, identity and other terminologies in that fold of international political theory has attracted many definitions. Unfortunately, many contributors approach these concepts from their own ideologies. Hence, broad areas of description of the term "security" exist. If defining security is that elusive, there is little wonder why operating within its coverage is so fluid. In the name of security, people and governments have taken actions where intended and unintended outcomes have become difficult to handle. Because of its seeming lack of conceptual boundary, security, as a concept, is used to entice and whip up patronage for many political projects both at the state and international levels of politicking. Hence, Paul D. Williams argued that "security is therefore a powerful political tool in claiming attention for priority items in the competition for government attention". The following references will be useful: Williams, Paul D. ed. Security Studies: An Introduction*, Routledge, UK, 2008. Makinda, Samuel M.* Sovereignty and Global Security, Security Dialogue, *1998, Sage Publications, Vol. 29(3) 29: 281-292. McSweeney, Bill.* Security, Identity and Interests: A Sociology of International Relations*, Cambridge University Press, 1999. Human Security Unit, United Nations Office for the Coordination of Humanitarian Affairs,* Human Security in Theory and Practice*(http://hdr.undp.org/en/media/HS_Handbook_2009.pdf). Musarrat, Jabeen.* Governance Divide*, Pakistan Horizon, The Pakistan Institute of International Affairs, Karachi, Vol. 56, No. 4, 2003. Beres, Louis Rene.* Terrorism and Global Security: The Nuclear Threat*, Westview Press Inc., 1979.*

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Our Constitution Our Pride

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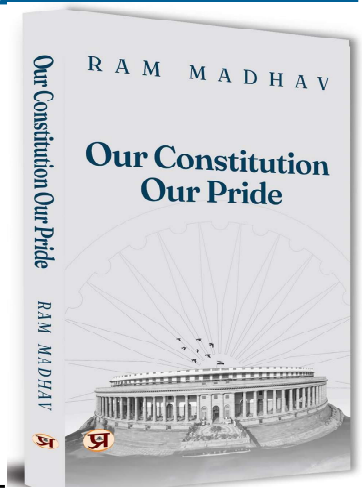

In the contemporary Indian political landscape, where constitutional debates frequently occupy centre stage, Ram Madhav's book *Our Constitution, Our Pride* represents a substantial contribution to the discourse surrounding India's foundational document. Published at a moment when the Indian Republic celebrates seventy-six years of constitutional governance, Madhav's work offers a meticulously researched historical account that traces the evolution of the Indian Constitution from its conceptual origins through its implementation challenges. The volume navigates the complex interplay between constitutional theory and political practice, presenting a narrative that is both historically illuminating and contextually relevant to current constitutional deliberations.

Madhav starts his analysis by situating the Indian constitutional project within its historical context, demonstrating that the struggle for a constitution began not with the Constituent Assembly in 1946 but much earlier. In his references to President Murmu's statement that the Constitution emerged from "our long freedom struggle", the author effectively argues that constitutional aspirations were inherently woven into the independence movement. The detailed examination of early efforts, including opposition to the Government of India Act 1919 and Mahatma Gandhi's reflections in *Hind Swaraj* (1909), offers significant historiographical insights that challenge the conventional periodisation of India's constitutional history. This approach represents a notable shift from typical constitutional histories that often start with the Constituent Assembly deliberations, creating a more comprehensive genealogy of Indian constitutionalism that acknowledges its indigenous intellectual roots alongside its engagement with Western constitutional traditions.

The author's treatment of the drafting process is notably nuanced, elucidating the intellectual contributions of various political figures while recognising the central role of Dr B.R. Ambedkar. Madhav carefully reconstructs the dialogic processes through which constitutional provisions were negotiated, revealing the complex ideological

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currents that influenced the final document. His thorough account of the eight committees established by the Constituent Assembly and the extensive deliberative process, comprising 7,635 amendments, 2,473 of which were discussed over 114 working days, provides readers with a nuanced understanding of constitution-making as an intellectually demanding collective endeavour. The biographical sketches of key figures like Ambedkar, who allegedly worked 18-hour days despite his poor health, humanise the constitutional project and highlight the personal sacrifices involved in its creation. This aspect of the narrative effectively counters reductionist views that attribute the Constitution solely to individual genius, instead portraying it as a synthesis of diverse intellectual traditions within Indian political thought.

Madhav's examination of the Constitution's core principles, which include democratic governance, an independent judiciary, and fundamental rights, displays significant theoretical depth. His investigation into how the founding generation understood these principles showcases a deep engagement with primary sources. His comparative analysis of Ambedkar's and Gandhi's distinct views on democracy highlights their mutual concern over unchecked majoritarianism, despite their perspectives offering different philosophical orientations. The author notes, "For Gandhi, democracy ensured the weak had the same opportunities as the strong. For Ambedkar, it involved amplifying the voices of the unheard." This interpretive lens provides valuable insights for modern discussions on Indian democracy. Madhav's meticulous reconstruction of these intellectual lineages allows readers to grasp the theoretical richness inherent in Indian constitutional thought while acknowledging its practical implications for institutional design.

The volume's historical contextualisation extends beyond familiar narratives, incorporating lesser-known episodes such as Gandhi's role in developing a constitution for the princely state of Aundh in 1939. Madhav documents how this experience, which emphasised decentralised governance, village panchayats, and fundamental rights, influenced subsequent constitutional thinking. Similarly, his analysis of the Nehru Report 1928, with its 22 chapters and 88 articles addressing fundamental rights, bicameralism, and federalism, illuminates an important but often overlooked chapter in Indian constitutional history. This archaeological approach to constitutional antecedents enriches our understanding of the intellectual ferment that preceded the Constituent Assembly's work.

The examination of contentious constitutional issues showcases Madhav's ability to engage with complex legal and political debates in a manner that is both scholarly and accessible. His discussion of Article 370, the Hindu Code Bill, the Uniform Civil Code, and other debated constitutional provisions offers readers a historically grounded understanding of these ongoing controversies. He maintains analytical rigour even when addressing politically charged subjects, presenting multiple perspectives before sharing his interpretations. His study of Ambedkar's unsuccessful efforts to integrate the Hindu Code Bill into the constitutional framework, along with the subsequent legislative history of this reform, illustrates the intricate relationship between constitutional aspirations and legislative implementations.

In his chapter "Misuse of the Constitution", Madhav offers a substantive critique of instances where constitutional mechanisms were used for partisan political purposes. His analysis of the misapplication of Article 356 (President's Rule) and the declaration of Emergency in 1975 is particularly sharp. Drawing on primary sources and legal scholarship, he details how constitutional provisions intended as "dead letters" (in Ambedkar's phrasing) were invoked to undermine democratic governance. This section represents one of the volume's most significant contributions, assessing how constitutional provisions can be subverted without formal amendment. The thorough analysis of Indira Gandhi's invocation of Article 356 fifty times during her tenure as Prime Minister provides an empirical foundation for theoretical discussions of constitutional subversion.

The chapter "Reform to Perform Better" warrants special attention for its engagement with contemporary debates about constitutional reform. Madhav thoughtfully examines various proposals, including those from the M.N. Venkatachaliah Commission established during Atal Bihari Vajpayee's government. His discussion navigates the tension between constitutional adaptability and the "Basic Structure" doctrine established in the Kesavananda Bharati judgement. While acknowledging the need for reforms to address evolving societal needs, the author emphasises that any modifications must preserve the fundamental character of the Constitution. This nuanced position avoids uncritical constitutional veneration and cavalier reformism, suggesting principled incrementalism guided by constitutional teleology.

Madhav employs a predominantly historical-institutional approach, examining constitutional evolution through political developments and institutional dynamics. The extensive use of primary sources- including debates from the Constituent Assembly, correspondence between key figures, and parliamentary proceedings- represents a significant strength of this work. The inclusion of annexures featuring foundational speeches, such as Nehru's address when moving the Objectives Resolution and Ambedkar's speech on the adoption of the Constitution, grants readers direct access to seminal constitutional texts, thereby enhancing the volume's value as a reference work. The methodological framework integrates legal formalism with historical contextualism, steering clear of both ahistorical textualism and reductionist political determinism. His work demonstrates substantial intellectual independence and scholarly integrity. His critiques of the misuse of constitutional provisions during various administrations reflect a commitment to constitutional principles that transcend partisan alignments. This intellectual honesty enhances the credibility of the work, even for readers who might not share all of the author's normative orientations. The willingness to acknowledge constitutional failings across different political eras demonstrates an admirable commitment to scholarly objectivity.

The book's concluding reflections on constitutional morality are particularly thought-provoking. It references Ambedkar's assertion that constitutional morality is not an inherent attitude but requires cultivation. Madhav emphasises that the Constitution's efficacy ultimately depends on adherence to constitutional principles and norms rather than merely formal compliance with the

constitutional text. This insight resonates with contemporary scholarship on democratic backsliding and constitutional resilience, suggesting potential directions for future research on India's constitutional trajectory. His invocation of American Supreme Court Justice Joseph Story's warning further reinforces the essential relationship between constitutional institutions and civic culture.

The author's prose is characterised by precision while remaining accessible, steering clear of both excessive technicality and overly simplistic generalisations. The synthesis of theoretical analysis with historical narrative results in a composition that is both intellectually robust and narratively compelling. The meticulous organisation of the content, alongside the strategic incorporation of primary sources, illustrates a degree of methodological rigour that is likely to resonate with academic audiences.

The book significantly contributes to Indian constitutional scholarship by offering a comprehensive historical account and thoughtfully engaging with contemporary debates. It will prove invaluable to scholars of Indian constitutional history, legal scholars, political scientists, and engaged citizens seeking a deeper understanding of India's constitutional foundations. Madhav's commitment to historical precision and analytical nuance makes this book a worthy addition to constitutional literature.

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