

INDIA FOUNDATION JOURNAL



Editor's Note :

- Corporatisation of the Ordnance Factory Board-
A Step in the Right Direction

- Maj. Gen. Dhruv C. Katoch

Focus : State of the Indian Economy

- Indian Economy: Prognosis and Prospects
- Global Lessons for the Indian Economy
to Achieve Technology Leadership
- New Economic Regime for
South Asia in the Post Covid-19 Era
- Indian Economy – The Challenges Ahead

- Shaurya Doval and Praket Arya

- Jaijit Bhattacharya

- Manmohan Parkash

- Sarvesh Kaushal

Defence and Security

- Application of Air Power in High Altitude Area
- Science of Biological Warfare and
Biopreparedness

- Air Marshal Sumit Mukerji

- Aakansha Bhawsar and
Sudeep Shukla

International Relations

- History is a Moebius Loop:
Geopolitics of Yesterday and Today

- Côme Carpentier de Gourdon

Law and Society

- Regulation of Temples:
An Aberration in a Secular State

- Siddharth Acharya

Book Reviews

- Shakti Sinha's "One Mountain Two Tigers:
India, China, and the High Himalayas"
- Simon Anholt's "The Good Country Equation:
How We can Repair the World in One Generation"

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Table of Contents

Editor's Note

| | | |
|---|---------------------------|---|
| Corporatisation of the Ordnance Factory Board- A Step in the Right Direction | Maj. Gen. Dhruv C. Katoch | 3 |
|---|---------------------------|---|

Focus : State of the Indian Economy

| | | |
|---|-------------------------------|----|
| Indian Economy: Prognosis and Prospects | Shaurya Doval and Praket Arya | 9 |
| Global Lessons for the Indian Economy to Achieve Technology Leadership | Jaijit Bhattacharya | 16 |
| New Economic Regime for South Asia in the Post COVID-19 Era | Manmohan Parkash | 31 |
| Indian Economy – The Challenges Ahead | Sarvesh Kaushal | 39 |

Defence and Security

| | | |
|--|------------------------------------|----|
| Application of Air Power in High Altitude Areas | Air Marshal Sumit Mukerji | 47 |
| Science of Biological Warfare and Biopreparedness | Aakansha Bhawsar and Sudeep Shukla | 57 |

International Relations

| | | |
|--|----------------------------|----|
| History is a Moebius Loop: Geopolitics of Yesterday and Today | Côme Carpentier de Gourdon | 67 |
|--|----------------------------|----|

Law and Society

| | | |
|---|-------------------|----|
| Regulation of Temples: An Aberration in a Secular State | Siddharth Acharya | 78 |
|---|-------------------|----|

Book Reviews

| | | |
|--|-----------------|----|
| Shakti Sinha's "One Mountain Two Tigers: India, China, and the High Himalayas" | Aanchal Pannu | 85 |
| Simon Anholt's "The Good Country Equation: How We Can Repair the World in One Generation" | Kuldeep Badlani | 87 |

India Foundation Journal

Vol. VIII
Issue No.5

September-October 2020

Editor
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India Foundation
New Delhi

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journal@indiafoundation.in

Website
www.indiafoundation.in

for private circulation only

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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.

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The India Foundation Journal, India Foundation's flagship publication, has been in circulation since 2013. The 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. Over the past few years, the journal has cultivated an expansive readership creating awareness on issues impacting the Indian society and has contributed towards policy formulation. 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.

Corporatisation of the Ordnance Factory Board : A Step in the Right Direction

Maj. Gen. Dhruv C. Katoch*, SM, VSM

Introduction

The year 2020 will long be remembered for the pandemic which originated from Wuhan in China and spread across the world, causing death and devastation in its wake. SARS-CoV-2, the virus that causes the coronavirus disease (Covid-19), has led to the temporary closure of innumerable industries with resultant job losses and has had an extremely debilitating impact on the major economies of the world. The Indian economy, which was already under stress from a variety of causes, was also adversely impacted. It was in such a bleak environment, that Prime Minister Narendra Modi delivered his Independence Day address from the ramparts of the Red Fort, with a clarion call for 'Atmanirbhar Bharat'. The address was a clear enunciation of the vision of the Prime Minister and the thrust of his government to rejuvenate the economy whilst tackling the pandemic and the security challenges that beset the nation from an expansionist China and an intransigent Pakistan, intent on continuing its proxy war against India, through support to terrorism.

The Prime Minister's address infused a sense of hope amongst the Indian masses and gave a clear and positive message to the Indian corporate, both public and private sector, that the government was committed to an economic revival based on self-reliance. The call for 'Atmanirbhar Bharat' was not new and had been made earlier by the

Prime Minister, but its reiteration on Independence Day was a clear message to all, of his governments resolve to chart India through the present difficult times and on to a more prosperous future. This has had its impact in the defence sector too, where two initiatives are set to strengthen India's defence industrial base. The first pertains to the corporatisation of the Ordnance Factory Board (OFB) and the second to a decision by the Ministry of Defence to place 101 items for the military on the negative list, which were till now being imported.

Role Of the Private Sector

India's defence needs can no longer be met solely by the public sector undertakings, and increasingly, the private sector will have to be called upon to manufacture a large part of India's defence requirements. One of the first initiatives of the Narendra Modi Government when the NDA won the 2014 elections was to launch the Make in India programme. This was a clear signal to optimism of the private sector to be vectors in achieving self-reliance in defence manufacturing. Make-in-India is a decisive and bold step towards attaining strategic autonomy. While the public sector has to date played a crucial role in catering to the needs of the security forces, it lacks the capacity to meet all of India's defence needs. Even seven decades after independence, India remains highly dependent on imports.

**Maj. Gen. Dhruv C. Katoch is Editor, India Foundation Journal and Director, India Foundation.*

Speaking at a function in Shillong on 28 September 2019, Defence Research and Development Organisation (DRDO) Chairman G. Satheesh Reddy, while stressing on the need to focus on indigenous defence production said that as of now, indigenous produce in defence manufacturing is just about 45-50 per cent and we are dependent for the rest on imports.¹ The focus of the government is hence on improving defence capability through indigenous manufacture of most of the country's defence needs. Towards that end, the Ministry of Defence (MoD) released on 3 August 2020, the draft Defence Production and Export Promotion Policy 2020, which aimed at a turnover of USD 25 billion in domestic defence sector production over the next five years, within which was set a target of USD 5 billion for exports in defence and aerospace goods and services.² Earlier, the Defence Production Policy of 2011, which had as its objective the goal to achieve substantive self-reliance in design, development and production of equipment/weapons systems/platforms and to create conditions conducive for the private industry to take an active role in this endeavour,³ while laudable, achieved little of significance.

Strategic sector dominance is a key requirement for a strong and stable India, and this cannot be achieved without the private sector being involved in the manufacture of defence-related platforms and equipment in a big way. Technology infusion, adapting to technological challenges, and organic technological advancement will be an essential pre-requisite of high-quality defence production. The government's promulgation of export friendly measures has enabled India to increase defence

exports to USD 1.54 billion in 2019, which marks a quantum leap from the USD 0.28 billion exports achieved in 2014.⁴ However, there is still much to be done if Prime Minister Modi's vision of achieving an export target of USD 5 billion in military hardware by 2025 is to be achieved.

Herein comes the importance of the measures recently announced to place 101 items used by the military on the negative list to boost indigenisation of defence production. The list is impressive and includes in its ambit light combat aircraft and helicopters, Short Range Maritime Reconnaissance Aircraft, Long Range – Land Attack Cruise Missiles, artillery guns, short-range missiles, shipborne cruise missiles, simulators, Wheeled Armoured Fighting Vehicles (AFV), Infantry small arms, some types of radars, ammunition of different types and a host of other items used by the military.⁵ Local manufacture of these items will give a big boost to the indigenisation effort and enable the creation of a strong and vibrant defence industrial base. The private sector will have an important role to play in this effort.

The Corporatisation of the OFB

The decision to corporatise the OFB was announced by Finance Minister Nirmala Sitharaman on 16 May 2020. This was the fourth tranche of the 'Atmanirbhar Bharat' initiative,⁶ and was intended to provide greater autonomy to the Board while imposing higher levels of accountability, with a view to improving the quality of manufactured goods in an acceptable time frame and keeping such products priced competitively. The Foreign Direct Investment (FDI) limit in defence manufacturing under automatic route was

raised from 49 per cent to 74 per cent, and a large number of weapons and their spare parts were placed on the negative list, to promote indigenous production within the country. Also announced was the rationalisation of the tax regime for Maintenance, Repair and Overhaul (MROs) of the Aircrafts in the country. Earlier, the aircrafts had to fly abroad for the MROs. This issue had been highlighted in the January-February 2020 issue of the India Foundation Journal, and it is indeed heartening to see that the recommendations as given in the article⁷ are now being implemented.

The fourth tranche of reforms also aimed at boosting the capabilities of the private sector by allowing them to use ISRO facilities and other relevant assets. The geo-spatial data policy is also being liberalised to provide for remote-sensing data to tech-entrepreneurs. Future projects for planetary exploration and outer space travel have also been opened to the private sector,⁸ thus opening a wide array of avenues which were earlier not available.

Challenges of the OFB

The OFB is a subordinate/attached office of the Department of Defence Production and is based in Kolkatta. It has 41 Ordnance Factories, 9 Training Institutes, 3 Regional Marketing Centres and 4 Regional Controllers of Safety working under it. The principal products of OFB include tanks and armoured vehicles, artillery guns, small arms and other weapons and ammunition of various types. The OFB also manufactures troop comfort equipment like uniforms, tents, boots, etc. Main customers of the OFB are the Armed Forces, Paramilitary Forces and Central Armed Police

Forces, with the Indian Army being the primary customer and accounting for 75 per cent share of the total sales of the OFB.

The Ordnance Factories were set up and spread across the country as “captive centres” to serve the needs of the Armed Forces, but have been dogged by high costs, quality concerns and time delays in delivery of products. This has raised serious concerns over the functioning of the OFB which are amplified below:

- (i) **Monopoly Supply:** As the OFB supplies products to the Armed Forces on a nomination basis, it has little incentive to improve its quality of products and maintain a timely delivery schedule. Because a captive market exists, the OFB does not have a dynamic system of getting customer feedback on issues which concern the user. The government has notified 275 non-core items of OFB which are now available to be procured from the market. These items were hitherto reserved for OFB, though they were readily available in the market.
- (ii) **Quality Issues:** The quality of products supplied by the OFB continue to be a cause of concern to the Armed Forces. The increasing number of cases of defective assemblies and components have been highlighted by the Service Headquarters in various forums. The high rate of Return for Rectification (RFR) cases indicate poor quality management and low-quality consciousness.
- (iii) **High Cost:** High cost of products is primarily due to high overhead charges in OFB, including high maintenance charges and high supervisory and indirect labour charges. Further, unethical procurement activities lead to extensive

inventories, and the additional cost gets loaded on to the cost of production.

- (iv) **Lack of Innovation:** Little incentive has led to minimal innovation and technology development in OFB products.
- (v) **Low Productivity:** Currently, there is low productivity of plant and machinery and workforce with a variation in productivity across the factories. Being the sole service provider for Armed Forces, there is no penalty for delayed delivery to the customers.

The present state of OFB is inconsistent with the requirement of defence production centre, which calls for a great deal of flexibility at managerial and functional levels. Decisions like the modernisation of plant and machinery, joint ventures (JVs), Transfer of Technology (ToT) agreements etc. are all subject to government financial regulations and instructions, which reduces the leverage and flexibility of any dynamic production and marketing unit. As a government department, the OFB cannot retain profits and therefore has no incentive to make profits. Lack of a fixed tenure at the top management level impacts on motivation to push the organisation to the next level of efficiency by taking bold and visionary but sometimes unpopular steps. Therefore, the current structure of the OFB is not suited for carrying out production activities in a highly competitive industry, which requires managerial and technical flexibility for production and marketing activities.

Reports of Various Committees

Various committees have been formed over the years to look into the functioning of the OFB.

The 2000 T.K.A. Nair Committee Report suggested corporatisation and the conversion of the OFB into the Ordnance Factory Corporation Limited (OFCL). Self-reliance was the key, wherein the corporation could start its long journey by relying on its own strengths, revenues and surpluses for growth. The proposed structure would also enable appropriate future changes in line with the dynamic, fast-changing global environment related to the production of defence goods. With a sharpened focus and an innovative approach to competitive ground realities in each product and value chain segments in India and in world trade, the Indian armaments industry could thus be enabled to carve out an array of opportunities for itself.

The 2004 Vijay Kelkar Committee report observed that in the existing set-up, ordnance factories (OF) by the very nature of the products they manufacture and in the manner in which they manufacture, have to continuously face the problem of obsolescence of existing technology, accessibility to newer technologies and their inability to meet the requirement of the user. Sustaining the OF in the current structure would prove financially and strategically costly for the user and consequentially for the country's defence preparedness. Therefore, the Committee recommended that all OF should be corporatised under one single corporation under the leadership of competitive management. The existing dispensation by the government to OF should continue for a period of three years to help to steer the changed process internally. It was observed that the formation of corporation alone would ensure that OF gets the desired functional

autonomy and become accountable and responsible for their operations and performance.

The 2015 Raman Puri Committee observed that it is essential to change the current functioning of OFB as an attached office of the Ministry and a budgeted entity, as it is entirely incompatible with the modern methods of production and practices. The Committee recommended splitting the current OFB into three or four segments as appropriate and converting these segmented Boards into DPSUs. A year later, in 2016, the Shekatkar Committee of 2016 also recommended corporatisation of OFB. Based on these reports and to strengthen their self-reliance in defence production, the government, on 16 May 2020, announced under the Atmanirbhar Bharat package, that corporatisation of OFB would be undertaken to improve autonomy, accountability and efficiency in ordnance supplies.

Advantages and Challenges of Corporatisation

The proposed transformation of OFB from a Government department to a public sector corporate entity will have several advantages. It would enable the Corporatised OF to form strategic alliances with Indian and overseas companies to develop new products, carving out a niche in the international armament industry and penetrate the defence export market. It would also provide greater flexibility in technology acquisition through overseas assets.

Corporatisation would lead to the creation of a sustainable business model and facilitate leapfrogging technology and innovation for self-reliance in defence. It would also enable increased

production capacity and retention of capability and knowledge base, having an overall positive impact on the employment sector with the creation of jobs in the long run.

More importantly, top management in the corporatised structure would be in a position to provide leadership and could initiate a change process to respond to competition. Unshackled from government procedures and controls, it would lead to improved flexibility and dynamism in decision making, which in turn would open up possibilities of creating new streams of revenues by leveraging engineering and technological capabilities.

While reducing import dependency for arms and ammunition, it would enhance combat efficiency of the Armed Forces. The move away from cost-plus mechanism to competitive pricing enables the procurement of quality products at a lower cost and ensures customer satisfaction through timely delivery. With under-utilised capacities in factories being better utilised, there would be a further reduction in costs of production. Finally, as the corporate entity moves from production-based to a technology-based organisation, this would further enhance self-reliance in defence capability. Moreover, converting OFB into a 100% Government-owned public sector unit would also ensure better equipment for the soldiers, ensuring their safety and strengthening their efforts in defending national boundaries.

The challenge to corporatisation comes from the large number of employees in the OFB. The 41 OF and other units of the OFB have three recognised trade unions—All India Defence Employees' Federation (AIDEF) which is a federation of Left unions; the Bhartiya Pratiraksha

Mazdoor Sangh (BPMS), which is an arm of the RSS affiliate Bharatiya Mazdoor Sangh, and the Indian National Defence Workers' Federation (INDWF). These trade unions have been opposing the proposed corporatisation and have planned to go on an indefinite strike from 12 October.⁹ Herein lies the challenge to reform in a sector as vital as defence. How this issue will be addressed will

determine India's quest to achieve self-sufficiency in defence production to at least 70 percent of its requirements. A strong defence industrial base will create a vast number of jobs and has the potential of enhancing India's GDP by one or two percentage points. But for that, the fears and concerns of the over 4 lakh civilian defence employees will need to be addressed.

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Indian Economy: Prognosis and Prospects

Shaurya Doval and Praket Arya*

Editor's Note: This article is an India Foundation initiative to examine the current state of the Indian economy post the COVID-19 outbreak and the challenges that are likely to be faced in resetting the economy over the short to mid-term. This transcript is of a conversation between Shaurya Doval, Member, Board of Governors, India Foundation and Praket Arya, Senior Research Fellow at India Foundation.

Praket Arya: If I can ask a simple question to a very complicated scenario, in one word, what do you think is the present state of the Indian economy?

Shaurya Doval: 'Serious,' would be the word.

Praket Arya: Despite a recovering stock market and growing employment numbers as suggested by data from the Centre for Monitoring Indian Economy, the size of the economy is in fact shrinking. Given the extent of our informal economy and the ongoing uncertainty because of COVID-19, to what extent can we rely on such projections for making informed decisions? And in your opinion, is the economy actually shrinking?

Shaurya Doval: I said *serious* to the previous question as these are unprecedented times. 'Is the economy shrinking?' - Yes. This phenomenon probably happened only once post-independence. We are in a serious situation, but this is a global phenomenon which is not just limited to India. The lockdown that followed the pandemic was an unprecedented response that governments all over the world took and this disrupted the economy. However, we must contextualise these facts. 2020

will be a year of contraction, even of major economies. The United States is expected to shrink by about 8%, the EU by about 10%, the UK by 10% and Japan by 6%. India, in comparison, is doing reasonably well, with its economy likely to shrink in the range of 4-4.5%. But, like most of the world, India will bounce back in 2021, and the recovery will be more than 7.5-8% as we see it today. As the world economies recover, so would the Indian economy. This year, in every possible sense, has been a *Black Swan* event. It is an unprecedented situation that emerged for reasons that were not foreseen, leading to lockdowns as a result of which economies worldwide have contracted. In light of the larger economies of the world, India has done a reasonably good job in limiting the extent of this contraction. The next natural phenomenon is a rebound because there is no structural breakdown of the economy. It's not as if the factories have disappeared or the demand has disappeared. The factories just closed down which led to a contraction and hopefully things will bounce back next year.

*Shaurya Doval is Member, Board of Governors, India Foundation. He is an Investment Banker with over two decades of experience in New York, London and Singapore, working with firms like Morgan Stanley and GE Capital. An alumnus of Hindu College, Mr Doval has an MBA from Chicago Booth and London Business School. He is also a qualified Chartered Accountant.

*Praket Arya is an economist by education. He is an alumnus of The University of Edinburgh, Scotland, and St. Xavier's College, Mumbai.

Praket Arya: We have many noted economists making observations on India and their observations are not just limited to the economy. For example, Mr Kaushik Basu who was the Chief Economist of the World Bank and also the former Chief Economic Advisor of India recently noted that initiatives like ‘Make in India’ and ‘Atmanirbhar Bharat’ “will further close our economy to the World”. Moreover, he stated that “economic growth in 2020-21 will be the lowest since 1947” owing to a “trust deficit and divisiveness in the social fabric of the country”. What are your thoughts on such observations? Do they have any merit?

Shaurya Doval: Things become a little prejudiced when trained economics start talking about areas which are not in their domain. I respect Mr Kaushik Basu but I do not agree with his observations. I believe that neither the contraction in the Indian economy nor its revival in the coming years has anything to do with any major social disruptions in India. India is a civilisational fabric woven over centuries. I also do not agree with his assessment that *Atmanirbhar Bharat* will actually close India and the Indian economy to the world. On the contrary, *Atmanirbhar Bharat* is probably the first time since Independence that India has the confidence to build an economy that is completely self-reliant. The pandemic has exposed to the world the harsh reality that countries cannot outsource their core industries to others. The strategic risks of doing so are huge. During the pandemic, the US realised that their pharmaceutical industry was heavily dependent on imports for life-saving drugs. About 80 per cent of the active pharmaceutical ingredients (APIs) used to make drugs in the United States are said to come from China and India.¹ To correct this dependence, the

US is now taking steps to make itself self-reliant in terms of essential drugs. In India, the defence industry, which is a core sector of our economy should have become ‘Atmanirbhar’ a long time ago. To state that *Atmanirbhar Bharat* will lead to the Indian economy being insulated is therefore not correct. On the contrary, it will enhance India’s confidence to engage with the global economy on its own terms, not as a mere recipient or in an aggressor manner, but as a country which can work and contribute to the evolution of the global economy. Today’s India is not what India was ten years ago. India is today a USD 3 trillion economy and the fifth-largest economy of the world. In the next few years, it will move up the ranks with its growth rates. A country and economy of India’s size must be able to control as many variables as it can so that the global economic structure is stable. The Prime Ministers vision and goal of ‘*Atmanirbhar Bharat*’ is thus not only good for India but for the rest of the world too.

Praket Arya: *The agriculture sector of the Indian economy is perhaps the most important and the largest sector that needs focus, given the sway it holds on the majority of the Indian population. The Prime Minister has now launched a Rs 1 trillion Agricultural Infrastructure² Fund to boost post-harvest management infrastructures and community farming assets such as cold storage, collection centres and processing units. Do you think measures like these that enable debt financing can pivot India to become a world leader in organic and fortified foods as the PM envisages? What is the growth potential of the same and what must new age Agri-innovators and Agri-preneurs do to make agri-business profitable and scalable in India?*

Shaurya Doval: This step is a great

recognition by the Prime Minister. Food security is a vital ingredient for any big power and it is good that India recognised this important imperative and has been working on it consistently since independence. As a result, we now enjoy complete food security. The pandemic, however, has exposed certain kinds of vulnerabilities which need to be addressed. About 50% of India's population depends on agriculture for employment. It is also a core sector of India's economy. The Indian farmer plays a vital role in India's economic architecture, which is why the Prime Minister refers to the farmer as the '*Annadata*' of India. Today the share of agriculture in the Indian economy is only 15%, and this number will further reduce with the growth of the economy. But that will not reduce the strategic importance of this sector. During this pandemic, where every other sector saw a recession, it is the Indian farmers who have ensured that we have a bumper harvest and so, despite the economic disruption, there will be no food shortage. Agriculture will remain vital for 1.3 billion Indians, and our economic planners must understand that.

Having achieved food security our next challenge is to substantially take this game to the next level. In the next few years, India must aim to become an exporter of processed foods. Under the WTO rules, pure export of agriculture will be difficult³ because every country will be protective in this regard but there are many countries that can benefit significantly from India's agriculture and food processing capabilities. Historically, we have underinvested in this sector and as a result, we today waste about 15% of our food production. We need to build capacities to not only process food, but also to convert this surplus into an advantage. The agro-startups can convert agriculture into a value-

added sector. This gives us the headroom to absorb more and more people in the agricultural sector. As 60% of the population is dependent on agriculture which contributes only to 15% of the GDP, it leads to low wages and low incomes for those working in this sector. Through innovation and technology, we can raise our productivity in this sector, which will be very good news for the country. The Prime Minister and the government allocating more funds is thus a timely step.

Historically, India has underinvested capital in Agriculture. While work has been done in research and improvement of soil quality etc, but substantial CAPEX investments have not been made in this sector because the limited capital available was diverted to infrastructure development and manufacturing. I think this is the first government that is now recognising that a certain minimum amount of capital must go into productive capital investment in the agriculture sector. Today, as we are surplus in food production, we need to look into the food processing industry and in the next 10 to 15 years, aim to become a provider of high quality and nutritious food to the rest of the world. There is a big market for that.

Praket Arya: Recently there has been a lot of controversy regarding the MSP (minimum support price). The Central Government has issued 3 new ordinances, i.e. [Farmers' Produce Trade and Commerce (Promotion and Facilitation) Ordinance, Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Ordinance, and the Essential Commodities (Amendment) Ordinance]. Some State Governments allege that through these ordinances, the Central Government is seeking to end the MSP regime. Do you think that MSP as a measure has served its purpose and is now no longer required?

Shaurya Doval: I am not an agricultural economist so I would reserve my definite statement on this because people of that field may have a better idea. But what I do understand is that the limitations are the artificial interventions in the market. These have actually created a certain kind of demand and supply gap that has led to unnecessary distress in the agricultural sector. The Indian agricultural sector is now reasonably robust on its supply side. When we try to find its right equilibrium, we have to bring about changes in crop rotation, quality of crop production and processing to support farmers so that they can better meet the demands of the market, rather than trying to artificially intervene in the market through support prices. To that extent, the concept of MSP may have outlived its utility. There is also a political aspect to it; there is an element of educating the country and building consensus around it. It is very important to do that when you plan to take back something which you have already given. But maybe the time has come to have a relook at this policy. One of the inputs we have received in the last few years is that the MSP has really created supply gluts in the agricultural sector which has been to the detriment and not to the advantage of the farmers in substantive terms.

Praket Arya: After the onset of the COVID pandemic we see that agriculture and manufacturing are two sectors that have been able to sustain and rebuild because enough has been done by the government to cater to these two sectors. With respect to the service sector, the impact of the pandemic has been very asymmetric. Certain consumer-facing services like home delivery chains and online meeting spaces have seen irregular growth. Others like the hospitality industry are in complete doldrums. For a sector

that is considered a Sunrise Sector and employs almost 10% of the total workforce in the country, what is the way forward? The Hotel Association of India, representing the organised Hospitality Sector is seeking a relief package from the Government and states that the sector is looking at a Rs 90,000 crore loss in revenue. What do you think the hospitality sector needs to do to revive itself?

Shaurya Doval: The unemployment numbers are now dwindling and we seem to have done better than anticipated. After the reversal of the lockdown, the unemployment numbers have shown a significant dip. In agriculture, it has come down to 6.6% and in urban employment, it is down to 9.5% from a high of 26% in May. Our overall unemployment rate today is lower than what it was in March as we went into the pandemic. Overall, as far as the manufacturing and agricultural sector is concerned, the unemployment rates are looking healthy and it means that the level of economic activity has indeed started.

With respect to the hospitality and the service sector, I think the government must continue to provide support for as long as it is needed to ensure that this sector does not get obliterated. This sector is a very important sector of our economy and governments all over the world right now are doing whatever it takes to support the core sectors of their economies. We are expecting that some parts of this sector will be able to bounce back owing to domestic demand, but in case the pandemic continues and the lockdowns and curbs on travel continue for some more time, I think it is but reasonable to expect that the government will need to continue its support to these sectors.

Because when we seek to become a solid economy, an economy that survives through cycles, we have to groom our sectors. This has been done

by all the major economies in the world. What it means is that they have borne years of losses but not allowed their industries to collapse, so that when the cycle turns, their industries can move forward. As an example, in the financial service sector post the financial crisis of 2008, the United States did not let all of its banks go down. The Federal Reserve intervened and actually ensured that after one or two banks had gone down, the financial system of the United States did not collapse. I think the Indian government needs to recognise that the service sector will remain a mainstay for an upwardly mobile Indian population. It is the sector which has allowed us to reap the benefits of globalisation because it is essentially our service sector that has allowed us to accelerate our growth. There are limitations to what we can improve in the agriculture and manufacturing sector as they will take a long time. So, even if it means that the government has to actively support the service sector, particularly the hospitality sector and the air travel sector, then it must do so. And it has many instruments to do that such as monetary stimulus, fiscal help etc. In my view, the hospitality and aviation sectors seeking support from the government is legitimate, and it is my expectation that the government will do whatever it can for them.

Praket Arya: In a program held by the Institute of Chinese Studies in July 2020, China's Ambassador to India pointed out that "92 per cent of Indian computers, 82 % of TVs, 80 % of optical fibres, and 85 % of motorcycle components are imported from China."⁴ How did India's economy come to this extreme level of dependence on China? Is it, as Harvard Economist David Landes, who wrote *Wealth and Poverty of Nations*, suggested that technological superiority allows countries to enforce aggressive economics i.e.

quote unrealistic prices to obliterate industries in unsuspecting companies/countries, manipulate currency, deploy prison labour to cut costs, follow few labour standards, artificially cheapen factor costs (esp. land), steal IPRs, and repeatedly use military power to browbeat one and all or is it something else?

Shaurya Doval: While India is partially responsible for allowing such a high volume of imports from China in certain key sectors, the Chinese have much to answer for. China joined the WTO in 2004 and told the world that it was a market-driven economy. This apparently was not so. Now, the European Union has brought out a legal case against China, on its claim that it is a market-driven economy. Between 2004 to 2020, we lost 16 years believing that China was playing by the same WTO rules that the rest of the economies of the world were following. India should not have fallen into that trap, but given the fact that India was one of the players in the market-driven economy, it had to abide by the rules of the organisation. As a result, India's trade deficit with China rose to as high as USD 63 billion by 2017-18.

India became a victim because we were unaware of the subsidies provided to Chinese manufacturers and of the banking structures they had. China underpriced its goods and infringed Intellectual Property Rights (IPR), which consequently reduced the costs. Not just India but the whole global economic order became a victim, and it is only now that the world is reacting to it. India has done some kind of course correction in the last few years as a result of which the real trade deficit fell from USD 63 billion to USD 48 billion. But it's still a pretty big number. It will take time for countries like India to recognise that there is a reason why we ended up with 92% computer

components and 80% of TV components coming from China.

India will need to change course with respect to its core industries and build in these capacities so that this anomaly can be corrected. The lesson learnt is that democracies and open economies can compete only on a level playing field. When organisations like the WTO are unable to ensure that some large economies play by the same rules, it creates a level of disequilibrium in the market where those playing by the rules are placed at a disadvantage. India will now have to enable import substitution of these technologies while trying to build these capacities internally and join the global supply chain by the dint of its competitiveness, technological innovation, product superiority and not by underhand market practices.

Praket Arya: The first round of financial stimulus was around about 1 to 2 months ago now. India Inc is expecting a second round of a fiscal stimulus. One, how soon can we expect that? Two, what do you think are the sectors and social schemes that need particular emphasis in the second fiscal stimulus if and when it happens?

Shaurya Doval: I don't know when the second stimulus can come but I think it need not be one or two financial stimuli. It needs to be as many stimuli as needed until the economy is back to being healthy and fully operational to its normal levels of activity. If this pandemic continues to disrupt the levels of economic activity for health or other reasons, then the government must continue to infuse a proportionate level of economic support so that whatever is disrupted, can be partially made up by government support.

Praket Arya: And it may not even be a cash stimulus because that would not be very great for the financial health of the economy?

Shaurya Doval: No, it can be a combination of stimuli. The government has all the instruments available to it to provide for this. It could even be a demand stimulus. Those are the instrumentalities, but philosophically the answer to the question is that there is no red line that the government should draw and this is what the government has been doing. In the first support package, the Finance Minister stated that this is an evolving situation and our reaction will continue to be proportionate and that India will continue to do whatever it takes to support our industries to come back to normalcy. So I think that message is by and large out there.

The economy in the manufacturing and agricultural sector front has started to revive. I think where we are stressed, is in our urban centres and in the service sector. And I think whatever the government can do in the short run will be very useful in supporting these sectors to enable them to overcome this situation. Some of them have been able to build their productivity through work from home and other measures, but it may not be enough. Government support can be much more direct, whether it is to the hospitality sector or to the aviation sector etc. where it can provide the kind of financial support that these sectors need. And there is even talk of having something like an urban NREGA so that the urban workers and the urban level of economic activities that were disrupted can be managed. This will infuse confidence and help in bringing back the rural workforce to enable the level of activity in our urban sectors to come back to its normal level. I do understand that some of it might be disrupted because of health reasons because these are dense clusters and we may have health outbreaks till a vaccine is found. It is important that the Central and State Governments direct the kind of support

to the sectors that need it and not try to go for a very generic response with the economy.

The earlier financial packages have been focused, giving sector by sector support depending upon their need. The success of this stands validated by the fact that once the lockdown ended, the sectors were able to come back in a significant way. So I think the government just needs to keep doing what it is doing and it just needs to get past this crisis and as a body function, not let any parameter of the Indian economy fall to a level below which the revival of that organ may be difficult. Obviously, we will have to take some cuts but we can only take those cuts up to a level where once the situation is back, the organ can go back to its normal functioning.

Praket Arya: Like my first question, if you had to make a guess, how soon can we say that the state of the Indian economy is strong?

Shaurya Doval: As I said in the start, 'serious' would be the state today. Nevertheless, 2021 looks very promising, with the present indicators showing revival of the sectors and a drop in unemployment numbers, which are lead indicators. Also, with the race in the world towards vaccine development,

the health issues related to the pandemic are likely to be addressed. India is good at developing response systems to be able to manage public health issues, and these are all signs of a positive change. We are now in the consolidation phase. I think the first quarter of the next financial year will likely witness a revival. And from some time in the middle of next year we should be back on our economic trajectory. Nothing really has been disrupted as our factories are there and so are our people. In a convoluted manner, the pandemic has allowed us to become more focused on the economy, to realise our infirmities and to look into any strategic mistakes that we may have made and apply correctives now. I think the Prime Minister's rallying cry of *Atmanirbhar Bharat* should be the focus of our economic thinkers, our policymakers, our institutions, and our industries. We must be able to get import substitution not only to cater to our demand but to also the world's demand. We must convert this crisis into an advantage. By next year we should, most definitely, be on course.

(This interview has been edited for its readability in text form.)

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Global Lessons for the Indian Economy to Achieve Technology Leadership

Jaijit Bhattacharya*

Introduction

The general view of the relationship between governments and industry is that the government formulates the operating framework for industries to operate on an arms-length distance from the government, except where government intervention is required for operational issues such as the issuance of a license, issuance of permits, taxation, etc. The government plays a limited role in formulating the vision for the industry or creating new industries, hence sticking to the principles of laissez-faire capitalism.

However, that is not how the world's advanced economies have been operating, irrespective of whether they are capitalists or otherwise. Governments are deeply intertwined with the industries, and the industries' growth has a direct impact on the government and its ability to gather taxes and spend on public goods such as infrastructure. These governments have evolved precedents and processes that are able to react to both immediate issues concerning the industries and long-term strategic issues impacting the industries and hence the economy. A key governance structural differentiator between advanced economies and the growing economies is how closely the government coordinates with the industries in the advanced economies to

orchestrate growth within the economy and leadership globally.

As an example, in the Mecca of laissez-faire, the USA, PCAST (President's Council of Advisors on Science and Technology), which is a government committee, came out with a report in 2017 that urged the government to take urgent steps for ensuring that the US industries regain their global leadership in semiconductors. Hence whatever needs to be done from a technology development perspective, global trade regime perspective, or a geopolitical perspective would be initiated by the US government.¹ The PCAST report concluded by saying: "we strongly recommend a coordinated Federal effort to influence and respond to Chinese industrial policy, strengthen the US business environment for semiconductor investment, and lead partnerships with industry and academia to advance the boundaries of semiconductor innovation. Doing this is essential to sustaining US leadership, advancing the US and global economies, and keeping the Nation secure". The matter of leadership in semiconductors is not being left to laissez-faire, contrary to popular beliefs of how the US government operates.

The proactive steps by the US Government do not stop at only promoting its semiconductor industry. It also ensures that other nations,

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especially China do not overtake its companies and its technologies. In September 2017, as one of the first actions of the then newly elected US President, President Trump issued an executive order blocking Lattice Semiconductor Corporation's proposed acquisition by Canyon Bridge Capital Partners, which was partly funded by China's central bank², under the CFIUS (Committee on Foreign Investment in the United States) framework. The US government did not want any crucial technology to be leaked to China.

If we look at the Chinese economy, given that a large number of its companies are actually believed to be driven by the People's Liberation Army (PLA), it is in the deep interest of the government to ensure that these companies, that are both traditional³ and in new-age industries⁴, succeed. Moreover, this is largely because the profits from these behemoths actually find their way back into the coffers of the government and/or the army or into those who control the government and the army.

Such close coordination between the government and the industry is not a feature of only communist countries and should not be dismissed as such. A quick look across the advanced economies in the world shows that these economies have maintained their leadership and grown because of the government's close coordination with the industry. It is to be noted that technology has been a key driver of wealth generation of the advanced economies and that the technology leadership of the advanced economies has been aided by global trade regimes such as TRIPS (Trade-Related Aspects of Intellectual Property Rights) which helped in

maintaining their lead in technology, besides several other policy driven factors⁵.

Role of the US Government in creating and supporting its Technology Industries

In the 20th century, the western world and Japan were the technological leaders, and hence the global economic leaders. These nations' governments set the direction of technology leadership that they would like to achieve and then carefully assimilated technologies from around the world and built on it rapidly to create new technologies and industries. Such orchestration of industry leaders on a global stage happened through close coordination between the government and the industry, with appropriate policies at local and global levels.

As early as in 1791, Alexander Hamilton wrote the 'Report on Manufacture'⁶ in which he urged for an activist and mercantilist approach by the US federal government regarding its economy. This was one of the earliest articulations of the government providing a direction in the role of technology for economic development. In the same decade, the federal government played an instrumental role in developing new production techniques and technologies by turning individual entrepreneurs with innovative ideas.

The United States has become a much-admired global economic and military superpower on its technological leadership. The US government has actively and repeatedly intervened in its technology industries to develop and promote what is usually termed as "moonshot" projects. These projects are aimed at developing groundbreaking and exploratory technologies and

are initiated by active and ambitious government efforts in tandem with their industry, which results in enormous benefits for the domestic US technology industry. This framework of government pushing technology development initiative with the private sector leading it has been followed by all countries since then, without exception, who have become leaders in technology.

One of the earliest pushes by the US government on their strategic pursuit of dominance of technology was the push for gaining leadership in the telegraph technology. In 1842, the feasibility of Samuel Morse's innovation of the telegraph was demonstrated with the funds appropriated by the US Congress. This initiative set the US industry players to become serious competitors in the telegraph industry and create very large number of jobs for Americans.⁷

Similarly, the US government's strategic intent in the second half of the 19th century to be a leader in the railway industry led to the creation of the US Railway network. The US federal government passed the Pacific Railroad Act of 1862 and the Union Pacific Act of 1864, which played an instrumental role in developing the US railway network. These acts provided substantial and significant financial incentives for the development of the US rail network⁸.

The US government has continued to pursue its policy of attaining leadership in strategic areas of technology by providing a guiding hand to its capitalistic industry, right into the 21st century, and continues to do so even today. Below are a few examples of the US federal government's push into key technologies that led to the US gaining tremendous leadership in these areas:

- (a) Development of dual-use industries, such as aircraft frames, engines: The National Advisory Committee for Aeronautics,⁹ formed in 1915, contributed significantly to the development of the US aircraft industry, a role it still plays, helping the US to stay as one of the global leaders in aeronautics. In fact, in 1917, the government also initiated pooling of patents to create the Manufacturers Aircraft Association, to help create a formidable domestic aircraft manufacturing industry.¹⁰
- (b) Radio- By pooling patents, providing equity, and encouraging General Electric's participation, the US Navy helped to create the Radio Corporation of America.¹¹
- (c) Computer Industry – Originated from the US government's wartime support for a program that resulted in the creation of the ENIAC (Electronic Numerical Integrator and Computer), one of the earliest electronic digital computers, and the government's encouragement of the industry in the postwar period.¹² It was built by University of Pennsylvania and funded by the Army Ballistic Research Laboratory. It led to the US becoming the leaders in computing globally.
- (d) Internet - Government support through the US Defense Department and the NSF played a critical role in the development of the Internet. Similarly, microelectronics, robotics, biotechnology, nanotechnologies, and the investigation of the human genome received significant support from the US government, which has turned these areas into major economic activities in the US. As Vernon W. Ruttan has observed, "Government has played an important

role in technology development and transfer in almost every US industry that has become competitive on a global scale.”¹³ Importantly, the US economy continues to be distinguished by the extent to which individual entrepreneurs and researchers take the lead in developing innovations and starting new businesses. In doing so they often harvest crops sown on fields made fertile by the government’s long-term investments in research and development.

European Government efforts for Technology Dominance

Europe and the European Union have continuously strived to gain leadership in technology through their industries. They have invested significant taxpayers’ money and governmental effort to remain ahead of the technology curve through guided innovation.

The European Union (EU) continues to stress on innovation at both the Union level as well as the regional level. For Europe 2020, the three priorities identified include smart growth, sustainable growth, and inclusive growth. The EU’s Innovation Policy places a strong emphasis on social innovation, recognising it as “an important new field which should be nurtured.” The Policy suggests creating a virtual hub of social entrepreneurs and supporting them with a European Social Fund (ESF)¹⁴.

In the UK, the existing framework under the Department for Innovation, Universities & Skills (DIUS) has focused on the lifelong learning and early-stage venture capital front. The Innovation Nation White Paper¹⁵ outlines the future of innovation in the country, providing intellectual

leadership by suggesting new policies based on new imperatives. Highlights include provisioning for ‘hidden’ innovation and demand-driven ideas and fostering collaboration between public, private and non-governmental organisations (NGOs) to transform public services. Aside from this, it stresses on reforming the Small Business Research Initiative (SBRI) and incentivising enterprises with investment and expertise to convert research into innovation. To prepare the next generation of innovators, it recommends getting educational institutions to emphasise on STEM (science, technology, engineering and mathematics) subjects.

Leadership in semiconductors has been one of the key focus areas of both the US and the European governments. The US has been leading the race through its early government initiative through the creation of the SEMATECH consortium.¹⁶ In a mould similar to SEMATECH, The Interuniversity Micro-Electronics Centers (IMEC) in Flanders in Belgium, is one of the world’s largest semiconductor research partnerships and strives to be a global “centre of excellence”. The organisation, which received around half of its €285 million in revenue in 2010 from company research contracts and most of the rest from the Flemish government and the European Commission, has a staff of 1,900 and more than 500 industrial residents and guest researchers. It also has research partnerships in the Netherlands, Taiwan, and China. It has “core partnerships” with Texas Instruments, ST Microelectronics, Infineon, Micron, Samsung, Panasonic, Taiwan Semiconductor, and Intel, and “strategic partnerships” with major equipment suppliers.

IMEC emphasises pre-competitive research

that is three to 10 years ahead of industry needs, and therefore takes on risky projects that partners cannot afford to do on their own. Researchers from academia and industry work together under the same roof on areas that include chip design, processing, packaging, microsystems, and nanotechnology. In July 2005, IMEC produced its first 300 mm silicon disks with working transistors, in a new 3,200-square meter facility. A production ASML lithography system installed in 2006 offered capabilities that at the time were beyond those available even at the U.S.-based SEMATECH.

The Texas Instrument executive Allen Bowling noted that moving a new material or device into production requires seven to 12 years of pre-competitive research.¹⁷ This is where IMEC has been of “great value” to its members, by reducing the cost of each company, while making Europe competitive from a cost perspective in the semiconductor space.

Also, given that electric vehicle technologies and lithium-ion batteries / other battery technologies are widely believed to be the next big industry, the European Union and many of its governments are marshalling its resources to ensure that Europe stays in the forefront of these new technologies.¹⁸ In fact, EU had set a target of 8-9 million Electric vehicles (EV) on the road by 2020, to boost its strategic intent of dominating the EV industry. France had a goal of 2 million EVs on the road by 2020; Germany had 1 million by 2020; Spain had a goal of 1 million EVs by the end of 2014, The Netherlands had 200,000 EVs as its 2020 target. The targets send out a strong signal to the industry in terms of the government’s commitment and support for large-scale EV adoption.

Initiatives of the French Government

The French government has consistently taken a leadership role in ensuring that France maintains its leadership in select areas of technology such as smartcards, semiconductors etc. France had gained leadership in semiconductor research through a consortium involving ST Microelectronics, Philips, and Freescale that worked till 2007. The French government intervened in 2007 to launch a massive initiative called Nano 2012.¹⁹ Nano 2012 was supposed to be one of the largest industrial projects in France, that targeted to make the Grenoble region a world centre for developing 32nm and 22nm CMOS (Complementary metal oxide semiconductor) technologies. The program involved nearly €4 billion in funding from the national, state, and local governments for R&D and equipment. The consortium partners included CEA-Leti Institute for Micro and Nanotechnology Research; IBM’s Fishkill, NY, semiconductor production complex; ST Microelectronics; the University of New York at Albany; ASML Holdings of the Netherlands; and Oregon-based and ST Mentor Graphics of Wilsonville, Oregon. The initiative was housed at MINATEC, a campus in Grenoble.

In addition to providing space, MINATEC also helped bring in academic programs from four universities. MINATEC also brought in its then state-of-the-art facility for 300 mm silicon wafer centre, a 200 mm micro-electro-mechanical systems (MEMS) prototyping line for fast development of new products, and one of Europe’s best facilities for characterizing new nano-scale materials. The Nano 2012 facility houses 3,000 researchers and 600 technology transfer experts.

It is critical to note that for every five researchers, there is one technology transfer expert. MINATEC has been publishing over 1,600 research papers per year and has been filing over 350 patents per year.

MINATEC is supported by over 200 industrial partners that includes Mitsubishi, Philips, Bic, and Total. Two-thirds of its annual €300 million annual budget comes from outside contracts. The French and local governments also provide it with funding, in addition to funding from the French Atomic Energy Commission and private investors. MINATEC forms a powerful tool of the French government to keep France in the forefront of semiconductor and other high technologies.

Way back in 2009, the French government also identified Lithium-ion batteries as a focus area. The French Atomic Energy Commission and the French Strategic Investment Fund formed a joint venture with Renault and Nissan to manufacture lithium-ion batteries²⁰. The efforts led to the setting up of a €600 million plant in Flins in France that can produce up to 100,000 batteries a year. The venture also has built plants in Portugal, Great Britain, and Tennessee. The French company Saft supplies lithium-ion batteries to Mercedes, BMW, and Ford.

In 2010, The French government had set a target of having 2 million electric vehicles on the road by 2020.²¹ Government-linked companies such as Electricité de France, SNCG, Air France, France Telecom, and La Poste have committed to buying electric vehicles. In addition, the government is investing €1.5 billion to support up to 1 million public charging stations.

Initiatives of the Japanese Government in High Technology

METI (Ministry of Economy, Trade and Industry) of the Government of Japan has been playing a pivotal role in ensuring that the Japanese industry stays as one of the leaders in the world of high technology. The government has many key initiatives that are ensuring that Japan maintains its technology lead. The METI model has been adopted in various forms by South Korea, Taiwan, and China, powering their industries into leadership in various areas.

The Japanese government realised that the Japanese industry needs to have a dominant play in semiconductors. When the Japanese semiconductor industry suffered a slump in the 1990s, policymakers looked to the past for ideas about how to revive it. Having been very pleased with the results of the Very Large-Scale Integrated Circuit (VLSI) project in facilitating the rise of Japanese semiconductor industries in the 1980s (Morris 1990), Japan launched an armada of projects that mirrored this strategy, including the Semiconductor Leading Edge Technologies, Inc. (SELET),²² Association of Super-Advanced Electronics Technologies (ASET),²³ Semiconductor Technology Academic Research Center (STARC), Millennium Research for Advanced Information Technology (MIRAI), Highly Agile Line Concept Advancement (HALCA), Advanced SoC Platform Corporation (ASPLA)⁶ (ERI-JSPMI 2002) and Extreme Ultraviolet Lithography System Development Association (EUVA).

For example, the Association of Super-Advanced Electronics Technology (ASET) that

focuses on equipment and chip R & D has produced more than 100 patents and completed a number of projects with industry, including ones that developed technology for X-ray lithography and plasma physics and diagnostics. ASET had also launched the Dream Chip Project, which focused on 3-D integration technology. It had also started an initiative on next-generation information appliances.

In 1996, the Japanese government also played a key role in pushing the industry to form the Semiconductor Leading Edge Technology Corp (SELETE), a joint venture funded by 10 large Japanese semiconductor companies²⁴. The consortium conducts collaborative R&D for production technologies for wafer equipment, which is then used by the consortium members to exploit in a competitive environment commercially.

The Japanese government also helped create the Millennium Research for Advanced Information Technology (MIRAI) program, for alternative materials for future large-scale integrated circuits which focused on technologies such as extreme ultraviolet lithography for 50-nm device manufacturing in conjunction with 10 Japanese device and lithography equipment purchasers.²⁵ In 2010, the Japanese government also launched a number of initiatives to shore up its share of the overall global lithium-ion battery market. Japan's New Energy and Industrial Technology Department Organisation (NEDO) have developed an ambitious roadmap that sees lithium-ion as the dominant battery technology. The Ministry of Economy, Trade, and Industry has a roadmap for the automotive industry that calls for up to 50 percent of cars to be "next-generation" electrified

vehicles and up to 70 percent by 2030. The roadmap also envisions up to 2 million regular chargers and 5,000 rapid chargers deployed across the country to "pave the way for full-scale diffusion." In fact, way back in 2010, the government's Fiscal Year budget included ¥3 billion for collaborate R&D by the government, industry, and academia for innovative batteries.

Role of Ministry of Economy, Trade and Industry (METI)

The evolution of the Japanese technology policy shows that it is not just limited to technological advancement, but rather, there are significant economic, political and institutional implications. Thus, a comprehensive approach is needed to prevent generating any negative outcomes and to take advantage of the synergy among different policies. Concerning the investment in the innovation process, the presence of market failures and the fact that the social rate of return is superior to the private rate of return justifies the State's intervention.

Although a clear philosophy was already expressed in a 1949 white paper (After WW II), the Japanese technology policy was often dictated by short-term visions and external pressures until a new philosophy was brought in. The new philosophy, with a particular emphasis on social contribution, fixed objectives that promote tripartite cooperation between government, industry and academia, to create a competitive environment and set an evaluation system. The system attempts to remove or reduce existing barriers to free the flow of people and ideas, set the rules of the game, and generate the dynamics of innovation.

Japan's technology policy generally uses a top-down approach. The State acts as a social planner by making decisions based on the information it possesses in consultation with relevant stakeholders. This is the structure that has been followed by other Asian countries that subsequently became economic powers. Perhaps this is the structure that India should look at very closely to power its own growth.

Digital Breakthrough Economies

Digital breakthrough economies are those economies that became leaders in technology in the last fifty years. Concerted efforts by their governments helped these nations achieve a pole position in certain specific areas of technology. They offer significant learning for India as India attempts to become a leader in Digital technologies.

Taiwan

Public-private research programs have led Taiwan's leadership in semiconductor design and fab since mid-1970s. One can say that Taiwan's dominance in semiconductors started with the government-funded Industrial Technology Research Institute (ITRI) by acquiring the 7-micron chip technology from RCA to spin off UMC, a leading global semiconductor foundry.²⁶ ITRI also helped launch TSMC, the world's dominant foundry. ITRI continues to operate substantial semiconductor-related R&D partnerships. The institute's Electronics and Optoelectronics Research Laboratories, for example, include programs in fields such as next-generation memories and chips for lighting and 3D imaging.

Taiwan is leveraging its advantage as a leader

in both semiconductor and flat-panel display manufacturing, which uses similar production processes to make both crystalline silicon and thin-film cells rival China a photovoltaic exporter. Taiwan ranks behind only China in crystalline silicon cells, with over 230 companies across the entire supply chain. Three companies, Gintech, Motech, and Solar Power, each are building 1.2 gigawatts to 2.2 gigawatts in new production lines. Industry consortia organised through Taiwan's Industrial Technology Research Institute are developing a range of processes for thin-film cells and printable photovoltaic cells, technologies that also are being developed by Taiwanese producers of digital displays and solid-state lighting devices. Government incentives for manufacturers include a five-year tax holiday, credits that cover 35 percent of R&D and training, accelerated depreciation for facilities, and low-interest loans.

Taiwan also offers an array of subsidies to accelerate domestic deployment of solar power, targeting 10 gigawatts of capacity. The government funds 100 percent of some photovoltaic projects in remote areas, as well as several "solar city" and "solar campus" demonstration projects. Under the Renewable Energy Development Act, Taiwan implemented a feed-in tariff that would incentivise distributed production of solar energy that could then be fed into the grid.

Taiwan aims to become one of the top three lithium battery producers in the world. This goal is spearheaded by Industrial Technology Research Institute (ITRI). ITRI formed the High Safety Lithium Battery SToba consortium of Taiwanese companies to promote the development and diffusion of SToba-based battery technology. As

of 2011, four Taiwanese companies had entered into production of STOBA lithium batteries and the local industry was projected to invest \$1.7 billion in 2012.

Korea

The phenomenal post-war development of South Korea is one of the most remarkable economic stories of the twentieth century. The small Asian nation in 1960 was one of the world's poorest countries, with a Gross Domestic Product roughly equal to that of Ghana and its per capita income being lower than that of India. In the next fifteen years, it transformed into the twelfth largest economy in the world with its per capita GDP being four times that of India. This transformation was orchestrated by Government intervention through a combination of state-directed bank financing, light and then heavy industrial export promotion, fostering of large industrial conglomerates (the fabled chaebol), and suppression of labor unions to create workplace peace.

These initiatives of the Korean government have culminated with South Korea being counted as a developed economy. As per Campbell²⁷ underlying Korea's strong economic development has been a consistent effort to create a robust science and technology (S&T) capacity. From the beginning of Korea's export-oriented drive in the 1960s, this has followed two parallel tracks: creation of a state-led research and educational capacity, centred on state-run research institutes, and in-house research and development efforts by the chaebol and some medium-sized firms. Universities, which were relatively weak S&T players till the late 1990s, were strengthened

through government intervention.

South Korea largely followed the METI model of Japan and worked closely with its chaebols to create technology powerhouses such as Samsung, LG, Hyundai etc.^{28,29} In fact, five of the biggest chaebols make up more than half of the Korean Stock Market's benchmark index.³⁰ From 1961-1988, the Korean Government created a rudimentary research capacity, focused on creation of government-run research institutions, a technical university, and a central research park, as the private sector gradually began to muster its own applied research capacity³¹. In the subsequent decade, the Korean chaebols became the leaders of R&D initiatives in Korea. The government provided significant funding for the National S&T Technology Program which became the preferred institution for catapulting the chaebols and the Korean industry into technology leaders. This program was later replaced by the 21st Century Frontier Program and specified research funds. By the turn of the century, Korea had achieved strong aggregate performance in terms of numbers of researchers and funds spent on R & D and continued to build on that advantage. The IT industry and, to a lesser extent, biotech have become the major drivers of technological and economic development. The government played a key role in growing the nascent IT sector, through a combination of privatisation of the national telephone service provider, creation of infrastructure, and dispute moderation.

As per Campbell, from the mid-1990s, Korean government has pushed for the possibilities of "Big Science," i.e., basic or foundational science. Korea participates in various international basic science

programs, and has created another big state funding effort (the 577 program) to support basic science. The government has spent much policy effort on drafting “visions” of future technological developments.

It would indeed be useful for India to look at the institutional structures adopted by Korea to transform itself so quickly, with a heavy focus on close coordination with the industries in gaining leadership in technology closely.

China

China was the next big economy after South Korea that rapidly transformed its economy from a low-income economy to an upper-middle-income economy in a short span of twenty years. China borrowed heavily from the Japanese and the Korean models to harness resources and accelerate growth in its economy. Besides the tools of using

(a) consortium led technology development and
(b) policies and regulations that are favourable to its domestic industries, it also heavily relied on a new state sanctioned policy tool for technology acquisition—illegal acquisition of technology through piracy, cyber hacks, state sanctioned IPR violations, forced surrender of IPR of western entities and other mechanisms that did not follow rule-based technology acquisition.

China has now emerged as a strong science and technology innovation player. The Organisation for Economic Co-operation and Development (OECD), along with the Ministry for Science and Technology, have been reviewing the policies for innovation in the country and have come up with gaps that we, in India, would be quite familiar with. As its medium and long-term objective, China

wants its dependence on foreign technology to reduce by 30 per cent and be among the top five countries in the world in terms of domestic invention patents granted, and the number of international citations of its scientific papers.

Chinese government regards the coming up of a domestic, globally competitive semiconductor industry as an utmost priority with a stated goal of becoming self-sufficient in all areas of the semiconductor supply chain by 2030. China faced significant barriers to entry in this mature, capital-intensive, R&D-intensive industry.³² China also offered many forms of support to photovoltaic manufacturers. For example, producers could access cash grants of between ¥200,000 and ¥300,000 (\$30,900 to \$46,300) available to high-tech startups that are less than three years old with no more than 3,000 employees.

Large “demonstration projects” by manufacturers get grants of up to ¥1 million. The China Development Bank offered low-interest loans of several billion dollars for major production plants. The bank reportedly provided \$30 billion in low-cost loans to photovoltaic manufacturers in 2010. A number of Chinese provinces offered further incentives, including refunds for interest on loans and electricity costs, 10-year tax holidays, loan guarantees, and refunds of value-added taxes. To open its production plant in China, Massachusetts-based Evergreen Solar was reported to have received \$21 million in cash grants, a \$15 million property tax break, a subsidised lease worth \$2.7 million, and \$13 million worth of infrastructure such as roads. Such subsidies have spurred massive expansion of production capacity. By the first half of 2009, some 50 Chinese

companies were constructing, expanding or preparing polycrystalline silicon production lines.

The Chinese government has further set procurement rules that require products for “government investment projects” be purchased from domestic sources unless they are unavailable. Purchases of imported equipment require government approval. China requires that at least 80 percent of the equipment for its solar power plants be domestically produced.

China’s Ministry of Industry and Information Technology had plans to invest around ¥100 billion (\$15.2 billion) by 2020 in subsidies and incentives over 10 years to support new-energy vehicle production. The government had set a target of selling 1 million electric vehicles a year by 2015 and aims to have 100 million by 2020. The government also offered a \$9,036 subsidy to buyers of electric cars and subsidised fleet operations in 25 cities. By 2018, China was manufacturing 1.2 million electric vehicles. The National Development and Reform Commission identified lithium-ion cells and batteries as strategic industries, and several government programs subsidise China’s industry through investment and tax credits, loans, and research grants. To give its domestic industry an extra edge, the government essentially requires foreign battery companies to manufacture in China if they wish to sell there.

The Chinese government has now changed gears with bringing in tremendous focus on technologies that power the 4th Industrial revolution such as Artificial Intelligence, IOT, robotics etc.³² This focus of the government, in tandem with the industry, has placed China as one of the leaders in Artificial Intelligence, poised to gain from the

economic benefits and the strategic benefits of being a leader in 4th industrial revolution technologies.

Government Supported Technology Acquisition for India

The question now is what are the institutional mechanisms that India should adopt, to make Indian economic players as leaders in various technology areas. India has been largely pursuing development of technology from scratch as the primary mechanism for technology development. In a few cases, such as the development of the Marut fighter aircraft, specialists were brought in from outside to help in the project. In the case of Marut, the renowned German aircraft designer, Kurt Tank was brought in, albeit by serendipity as Kurt Tank had chosen to live in India at that time^{33,34}. In limited other cases, joint ventures were used to catapult India to technology leadership, such as the Bramhos supersonic cruise missile project that is a joint venture between Indian and Russian state-owned defence research entities³⁵.

However, there have been limited centralised initiatives to marshal the nation’s resources to catapult Indian industry to the heights of technology leadership. In February 2020, the Indian government constituted an empowered Technology Group (TG)³⁶ for providing timely policy advice on latest technologies; mapping of technology and technology products; commercialisation of dual use technologies developed in national laboratories and government R&D organisations; developing an indigenisation road map for selected key technologies; and selection of appropriate R&D programs leading to technology development. The

empowered Technology Group stops short of actual acquisition of technology and the technology ecosystems that is necessary to help the Indian industry gain dominance.

For example, very few will debate the fact that India's burgeoning aviation industry calls for India having its own single aisle passenger aircraft. It is expected that India will require 2,300 single aisle aircrafts worth USD 320 billion in the next 20 years³⁷. By creating India's own aircraft manufacturing industry, it is obvious that a large number of jobs, economic benefits and associated strategic benefits will accrue to India. However, aircraft manufacturing is extremely complex and requires hundreds, if not thousands of component manufacturers. It would take decades to build the ecosystem and the technologies to be able to have a single aisle aircraft that is state of the art and is able to compete with other aircraft manufacturers globally. Hence, it would be almost futile to pursue such a program and divert billions of dollars from other more pressing needs of the country. However, as of 2020, there are opportunities to acquire aircraft manufacturers at very low costs, with a running book, a running team and with an existing ecosystem. A prime example is the Brazilian aircraft manufacturer, the Embraer as well as possibly the Sukhoi SSJ100 regional jet. The Embraer was to be acquired by Boeing for USD 4.3 billion for 70% stake.³⁸ With that arrangement not coming through, Embraer could potentially be acquired by an Indian entity, backed by the Indian government.

The question is, what is the backing that is needed from the Indian government for such an acquisition? For starters, an acquisition of this kind

has to be a leveraged buyout (LBO), which implies that the purchase has to be funded by the company's future sales. Thus, the Indian government can provide support by pushing banks to be the lenders for the deal. In addition, perhaps the Indian military can purchase transport aircrafts to enable the order book to roll. For the future, policies and regulations can be adopted to provide preferential access to the Indian market as well as markets where India can exert geopolitical influence. In addition, interested Indian business houses can be selected through an open process.

For sure, the Indian government would have considered the above acquisition. The larger point is, do our acquisition mechanisms provide for the agility needed to grab such opportunities? Or do we need to create a special institutional mechanism to be able to go out and acquire technology in a much more rapid manner, with a quicker response to market opportunities. Similarly, there are other mechanisms of technology acquisition that have been adopted by other nations that India needs to deploy in a concerted manner.

In summary, technology acquisition needs to be done, along with creation of entire ecosystems, in a combination of the following manners:

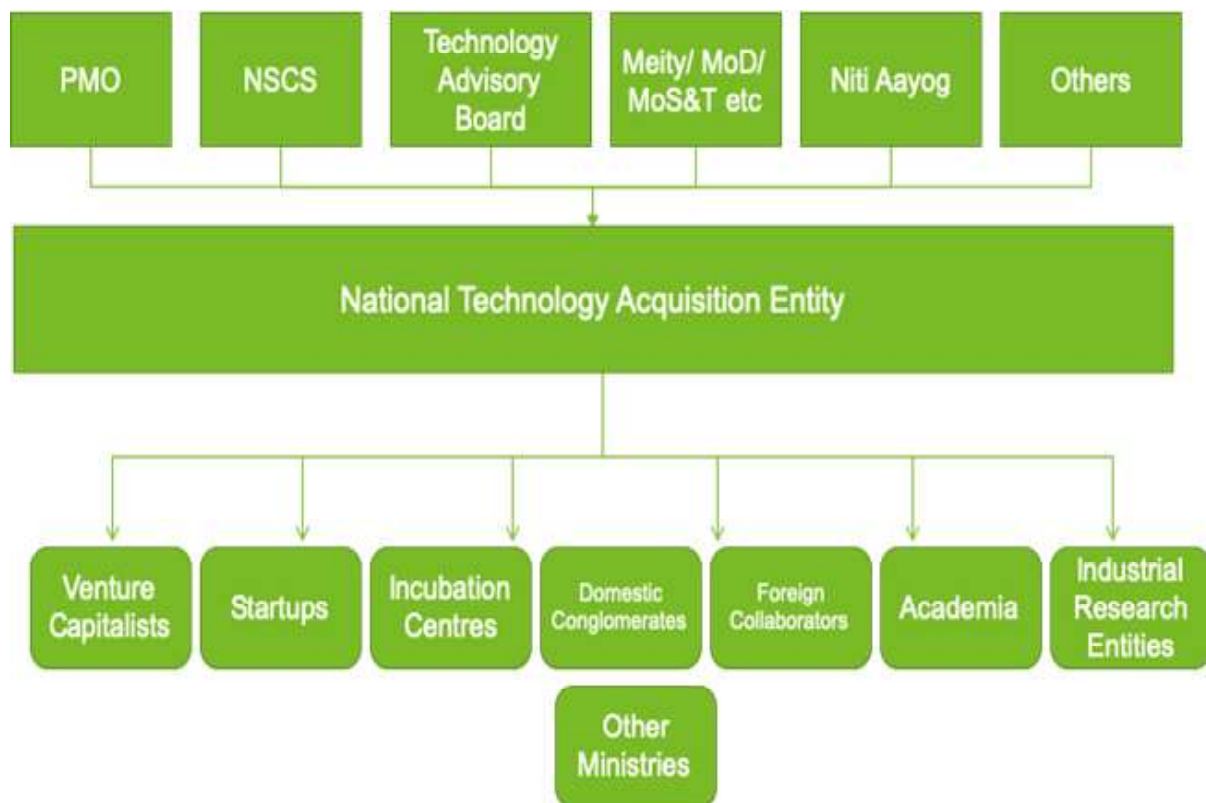
- Build new technologies in-house with Indian private sector through procurement
- Create consortium of Indian players to pool and build new technologies
- Buy technologies from outside India
- Hire experts from outside India who have built the technologies
- Buy companies that have the technologies
- Get the technology by other means
- Innovation in procurement

Along with the above, a CFIUS like regulation and its active implementation would also be necessary to protect the technologies acquired and developed in India³⁹.

Conclusion

India would need to adopt an institutional structure to be able to rapidly acquire technology and technology ecosystems for its industries in order to accelerate its growth and increase per capita GDP of the nation.

It is proposed that perhaps a National Technology Acquisition entity be formed that works with the existing institutions of National Society of Collegiate Scholars (NSCS), Technology Group, Ministry of Electronics & Information Technology (Meity), MOD, MoS&T, Niti Aayog and other line ministries, while marshalling the resources from banks, venture capitalists, startups, incubation centres, domestic conglomerates, academia, industrial research entities and foreign collaborations, as shown in figure below:



Similar structures have been proposed earlier by the author⁴⁰ in 2013, and in 2015⁴¹. Such a structure would lend towards bringing in all the mechanisms of technology acquisition across the civilian and dual-purpose industry landscape in a credible manner and help power the Indian economy towards global leadership.

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New Economic Regime for South Asia in the Post COVID-19 Era

Manmohan Parkash*

COVID-19 Situation and its Impact

Since the identification of the initial cases in late 2019, the outbreak of the coronavirus disease (COVID-19) has been spreading across the globe. Followed by the initial spread in Northeastern Asia, COVID-19 spread rapidly in Europe, the Americas, and later in the remaining areas including South Asia, leaving no region free from the threat of the virus. As of 15 August 2020, more than 21 million cases were reported globally with about 755,000 deaths.¹ In South Asia,² More than 3.1 million cases are reported with about 60,000 death. Some of the countries, which had been hit relatively in early-stage and managed the outbreak with a well-functioning health system, have successfully contained the outbreak while COVID-19 is still rapidly spreading in some other countries. South Asia was considered relatively safe from the threat even after the detection of the first cases in the countries. For example, after the first case was detected on 30 January 2020 in India and 8 March 2020 in Bangladesh, the number remained low for about one to two months in these countries. However, since then the number has increased rapidly, recording more than 2.5 million cases in India and 270,000 cases in Bangladesh as of 15 August 2020.

The ongoing pandemic is not merely a threat to the health system. The associated containment measures such as full or partial lockdowns of the countries with restrictions on the movement of

people and goods within and across border have caused substantial economic and social cost through various channels. The supply chain disruptions have slowed international trade, putting many developing economies at risk, which are dependent on the export of manufacturing goods and import of intermediary goods. Domestic containment measures stalled economic activities, forcing many factories and offices to shut down during the lockdowns. As a result, domestic consumption and investment declined, which have been further worsened by the social distancing measures and fear. Travel bans, closure of the borders, and precautionary behaviour drastically reduced the travel demand, placing the entire aviation industry and tourism sector in an unprecedented crisis.

All these led to a global recession, accompanied by a huge amount of job losses. The Asian Development Bank (ADB) projects 0.1% of real GDP growth rate in 2020, compared with the 5.1% growth in 2019, for developing Asia while the major advanced economies of United States, Euro area, and Japan in the aggregate are expected to contract by 5.1%.³ An estimate by the International Labour Organization indicates that working-hour losses have worsened during the first half of 2020, especially in developing countries. Compared to the fourth quarter of 2019, working-hour losses for the first quarter of 2020 reached to 5.4% of global working hours, equivalent to 155 million full-time jobs, which has further worsened in the second

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quarter of 2020 to the loss of 14.0%, equivalent to 400 million full-time jobs, i.e., soaring unemployment rates.⁴ This will reverse the trend of the poverty reduction in the developing countries, pushing back many millions into poverty, wiping away the gains made in the last few decades.

This unprecedented pandemic and its impacts are changing the global landscape in social and economic activities. There will be a new norm in post-COVID-19 era in the movement of people and goods, social life, and economic activities. Certain areas will fall into decline under the rapidly changing environment while some will emerge to meet people's new needs. The current situation, in that sense, is a challenge, at the same time opportunity. South Asia is not an exception to this and to continue its economic growth and social development as in the past decades, countries should quickly adapt to the new norm. This article intends to offer some thoughts on how the world would change and how to prepare the post-COVID-19 period for South Asian countries.

Development strategy with a stronger emphasis on the health sector

There exist large varieties in economical sizes and structure among South Asian countries from some of the world's smallest economies like Bhutan and Maldives and the world's fifth-largest economy of India by nominal GDP. Bhutan and Nepal as landlocked economies and Maldives as a small island developing State face challenges like limited resources, remoteness, and vulnerability to natural hazards and external shocks. Countries like India and Bangladesh are benefiting from its young and plentiful labour force and are well placed for globalization and linkage to the global value chain. Regardless of the varying economic characteris-

tics, all the countries in South Asia are under development path as low-income or middle-income countries. Guided by the well-structured and targeted national strategies and plans, and benefited by the vibrant young population, South Asian countries have been successful in achieving robust economic growth in recent years and the region is now the fastest-growing in the world.

The success of economic growth in South Asia was anchored by the infrastructure development and export-oriented growth strategy of which the effectiveness was proven by other countries in Asia like Japan, Republic of Korea, and the People's Republic of China. It is still believed such a strategy would be effective considering the abundance of the labour force and demographic dividend in the region. However, the pandemic has revealed the importance of the health systems, which had received relatively low attention in the course of development. The pandemic indicates that a well-established health system directly contributes to economic resilience and countries with well-functioning health systems have showed the possibility of quick and robust economic recovery. The governments recognized the importance of the health infrastructure and allocated a significant portion of the relief packages to the health sector. In South Asia, the allocation on health is slightly higher at 0.6% of GDP than the average allocation of 0.5% of GDP in the packages announced by G20 countries. National budgets and development plans are also expected to put a stronger emphasis on the development of the health sector in the coming years. For example, the national budget of Bangladesh for the fiscal year 2021, announced in June 2020, allocated 7.2% of the total budget for the health sector, increased by 14% compared to the previous year. It is also expected that the Eighth

Five Year Plan for Bangladesh would initiate significant reforms in the healthcare system. Under the new norm in the post-COVID-19 era, a more robust health system, including a well-functioning public health system, with widespread health insurance program, will be a critical factor that can reduce the uncertainty in similar events like the COVID-19 pandemic.

Social protection and social safety net

Social protection and social safety nets are critical for inclusive growth, protecting the poor and vulnerable from impacts of economic shocks, natural disasters, and other crises like the ongoing pandemic. It is estimated that about 36% of the very poor escaped extreme poverty because of social safety nets, including cash, in-kind transfers, social pensions, public works, and school feeding program. They also lower inequality and reduce the poverty gap.⁵ The cascading impact of the health crisis to economic and social crisis during COVID-19 pandemic stresses the efficiency and effectiveness of the social protection and social safety net. In response to the urgency for basic needs of the poor and vulnerable, who lost their job and whose movement were restricted, countries expanded their existing social protection and safety net programs by adding additional beneficiaries and provided direct cash transfer and free or subsidized food. Due to the timely and immediate actions taken by the authorities, many of the poor and vulnerable were relieved from the stress for basic needs.

At the same time, the experiences during the pandemic also revealed the weakness in the existing programs in areas of efficiency, traceability, accountability, coverage, etc. There still exist vulnerable groups which are not well covered by

the existing programs. For example, informal workers who occupy the majority of the labour force in urban areas of some South Asian countries are not fully covered by the existing programs or the relief package against the COVID-19 impact. Due to weak monitoring and tracing system, there exist chances for omissions of the potential beneficiaries or leakage to the unqualified citizens. Also, due to the weak financial status of the governments, all the qualified beneficiaries may not be covered in the respective program or the level of benefit may not be sufficient to cover the basic needs. The COVID-19 pandemic raised these aspects to the surface and provided the opportunity to revisit existing social protection and safety nets. The reforms in social protection and a social safety net should be towards more comprehensive coverage and immediate delivery to the targeted beneficiaries.

Agriculture sector productivity and economic resilience

While the share of agriculture sector in national economies of South Asian countries is not as high as the manufacturing and services sectors, it is still the largest labour employing sector in South Asia. For example, while the share of agriculture in the Indian economy is only about 14% of GDP, the employment share is about 49%. Similarly, with 13% of share in GDP, the agriculture sector employs about 40% of labour in Bangladesh. This means the sector is still labour-intensive in South Asia, unlike the capital-intensive agriculture in advanced economies. Due to such characteristics, the agriculture sector in South Asia has been severely affected by the COVID-19 pandemic. With the lockdowns and restrictions in movement, harvest activities were hampered due to the lack

of seasonal migrant workers, and access to farm inputs like seeds and fertilizers became challenging. Disruption in the transport system caused challenges in the delivery of agricultural products to the consumers though governments allowed the movement of the agricultural products. In addition to the supply side disruption, limited mobility and reduced income due to prolonged lockdown and closure of the businesses disrupted the demand for food, resulting in food security greatly affected, and raising concern for the nutrition status of the poor and vulnerable.

The current experience under the pandemic further emphasizes the need for improved agricultural productivity and reforms in the agriculture sector in the region. For this, a comprehensive and holistic plan with actions for different time span should be established and implemented. In the short term, measures to mitigate the impact of COVID-19 should be implemented, especially for the small and micro-farming houses. First of all, the disrupted supply chain for agricultural labour and farm inputs should be restored with enough safety measures on the ground. Access to up-to-date information about the pandemic situation and market prices should be provided to the farmers with the support for access to the market. Groups farming in India is a good example which overcame the impact of the pandemic through information exchange among farmers, aggregated production and arrangement of transportation.⁶ Financial support to the farmers and agribusiness is also essential as a short-term measure to ensure the continuity in their business activities. It is a relief that several stimulus packages announced by the governments include support to the agriculture sector with loan

guarantees, working capital finance, and refinancing schemes. International collaboration should be sought to ensure food security and stabilize food prices. ASEAN Plus Three Emergency Rice Reserve is an excellent example of international collaboration in strengthening food security, poverty alleviation and malnourishment eradication without distorting regular trade among its member economies.⁷ Countries in South Asia can establish a similar mechanism to enhance the food security and respond to emergency food shortage situation, utilizing existing frameworks such as SAARC, SASEC, or BIMSTEC.

COVID-19 pandemic is an excellent opportunity to further strengthen the medium to long-term actions with policy reforms that can ensure sustainable and resilient development in agriculture. Continued investment in agriculture infrastructure can enhance the competitiveness of the sector. In addition to investment in the traditional infrastructure, lessons from the pandemic urge the development of the strengthened logistics system, which can directly link the farmers and small agribusinessmen to the consumers, ensuring fair prices for the producers. Mechanization and automation in agriculture and agri-business is another area where medium to long-term intervention is required. This will not only improve productivity but also enhance the resilience to events like a pandemic. As such, the process is costly, especially for small-scale farming, innovative modalities can be considered like equipment leasing and sharing economy. Besides, investment in agricultural research and development, institutional and legislative reforms to support the new and innovative initiatives would contribute to the productivity increase and enhanced food security.

Urbanization and Urban Policy

The spread of COVID-19 pandemic has been severe in large cities due to high population density, large gathering, and the intensive movement of people. The urban sprawl caused by unplanned urbanization, insufficient water, sanitation and hygiene services, and lack of medical facilities has aggravated the impact of the pandemic. However, large cities drive economic growth as centres of production and consumption, employment generation, and innovation. The progress of urbanization is still at an early stage in South Asia, with only 34.4% of the total population living in urban areas, compared with the world average of 55.7% or 80.8% in OECD countries.⁸ Therefore, urbanization will continue to increase, given its critical role in economic development.

In preparation for the post-COVID-19 era, countries should revisit urbanization policies so that cities in South Asia can be livable, resilient, and smart. The governments should look at optimal population that cities can host, and adopt integrated and sustainable urban planning, facilities and utilities, and standards. Targeted investments in clean water, sanitation, public health, food supply, energy provision, and transportation networks, with better and innovative technologies and systems, will help optimize the economic activities. The development of peri-urban areas, satellite cities and urban renewal will lessen the burden of the megacities and diversify economic centres. A planning approach with broader consultations with different stakeholders can help control the urban sprawl and create a stronger coalition for change, thereby helping cities become a pillar of resilience.

Supply Chain and Logistics

Logistics industry facilitates global manu-

facturing by connecting firms to markets through various services like multimodal transportation, freight forwarding, warehousing, and inventory management. Better logistics performance is positively related to the higher income, and it demonstrates the sector's contribution to productivity and economic growth. Better efficiency in the logistics sector means higher competitiveness and potential for higher economic growth.⁹ The COVID-19 induced lockdown, restriction in movements, and travel bans have directly affected the supply chains and brought drastic changes in the logistics industry. The impact was not even on the different segments of the industry. The business-to-business logistics market was almost at a standstill with the disrupted supply chains. In the meantime, the business-to-consumer market has remarkably expanded as people opted for online shopping for the essentials. With the reopening of the economies, companies are diversifying their sources and relocating the supply chains closer to their business to avoid potential disruption in the future. The profile of the goods being delivered to consumers have changed and this segment of the logistics industry is expected to flourish in the post COVID-19 era.¹⁰

For South Asian countries, many of which set export-oriented strategy as a critical pillar for development, it is critical to catch the changing environment and adapt to new normal quickly. In the post-COVID-19 era, several changes in the supply chains and logistics are expected, which will also affect the manufacturing base in South Asian countries. The foremost changes would be shortened and diversified supply chains through nearshoring in regional level or domestically reshoring for companies to enhance the resilience to the external shocks like the pandemic. This may

benefit countries with capable manufacturing sectors and favourable beneficial exports policies. As the least integrated region with intra-region trade at less than 5% of total trade, such development can be challenging as many of the main export products overlap among the countries. However, at the same time, this can promote the diversification of the products and services in different countries with enhanced regional cooperation. In the business-to-consumer market, the last mile logistics with e-commerce will be further expanded as we already observe during the lockdown periods in many parts of the world. The technology solutions like real-time tracking, smart locker, and use of robots and drone will further evolve, which make safe, convenient, and contactless delivery possible. These changes will be complicated, and the implications will be multifold, but for South Asia to remain the fastest-growing region, it will be critical to adapt to the changing environment and grab the opportunity quickly.

Role of Governments and Policy Recommendations

Those mentioned above will be only a part of the changes we will face in the post-COVID-19 era. This will affect all economic units—consumers, farmers, manufacturers, services providers, and the public sector. While all need to prepare for the new norm, the role of governments are especially crucial as the new norm should be directed to the sustainable, inclusive, and resilient economic growth path. A few points are listed here that the government should take in the changing world with policy recommendations.

The foremost and urgent role of the governments is to bring the disrupted economies by the COVID-19 pandemic back to normal. All

governments in South Asia are implementing the stimulus and relief packages to mitigate the impact of COVID-19 and stimulate economic recovery. While the size and the contents of the packages vary depending on the economic structure and the impact on the economy, they commonly include measures for strengthening healthcare system, protecting the poor and the vulnerable, preserving employment, and supporting businesses, including micro, small and medium enterprises (MSMEs). Central banks in the region have also injected liquidity to financial markets to support business continuity and recovery. Properly implementing these measures as intended will be the first step for facilitating economic recovery in the short run. However, the economic recovery process will be longer than expected with the prolonged pandemic situation, and the new norm will prevail as discussed above. Therefore, while implementing the immediate stimulus and relief measures and preparing further policy actions for economic stimulus, the governments should acknowledge that the situation after COVID-19 will not be same as before and new norms should be taken into account. Accordingly, adjustment of the national strategies or reflecting the new norm in the new national strategies will be required.

Sound and prudent fiscal and monetary policies will be critical for governments to maintain political and economic stability in the coming years. Concerns exist in South Asian countries due to the worsening macroeconomic imbalances by COVID-19. National revenue will reduce due to the disruption in economic activities while the expenditure will increase to implement the stimulus and relief packages, debt level will increase due to significant borrowing, and non-performing loans are expected to soar. Therefore, the fiscal and

monetary policies should be appropriately designed so that they can benefit the sectors that fit in the new norm after COVID-19. Enough liquidity should be provided to those sectors with proper regulatory reforms that can provide an enabling environment. Borrowings from international financial markets and multilateral development banks should be wisely planned so that the much-needed sectors can be adequately supported. Reforms in the financial sector will be critical to enhance the resilience of the economy.

The governments in South Asia should allocate more resources in public research and development (R&D) and promote private R&D. Governments need to be proactive in promoting and investing in R&D for the development of innovative systems. Otherwise, the R&D environment in South Asia will be further deteriorated by COVID-19. It is a well-known fact that investments in R&D are crucial for economic growth. Recognizing the importance of the R&D to recover from the pandemic swiftly, several governments in the world are strengthening their R&D capacity. For example, the UK government has declared plans to expand public R&D investment as a strategy to cope with the COVID-19 induced recession. South Asian countries should strengthen the R&D environment and invest in future technologies to realize their potentials, bring diversity in the economy, enhance resiliency, and adapt to the new norm in the post-COVID-19 era. Not only should there be an increased investment in R&D, math and science education should be accompanied to provide soil for future innovation.

Regional cooperation among South Asian countries and other regions will be critical to quickly recover from the economic downturn and prepare for the post-COVID-19 era. Regional cooperation

has never been more important than the current time. In addition to overcoming the health crisis, countries can collaborate for enhanced food security, development of new supply chains, and political and economic stability. Wide range of difference in economic size and structure can enable us to find win-win solutions for the regional members. Potential for increased intra-region trade in South Asia should be actively sought with economic diversification in each country. Economic regions may be defined by economic resources such as raw materials, industry concentrations, labour markets, and available infrastructure. They can share talent, capital and technology across regions and national boundaries to drive one-another's prosperity. South Asia is large enough to achieve a critical mass of companies, institutions, infrastructure, and talent. With almost a quarter of the world's population living in the region, "act regionally, and compete globally" can help the region prosper.

Regions vary by relative strength from which regional specialization or comparative strengths can emerge. Recognizing the region's strength and connecting with other regions for mutual benefit could help establish value chain and production networks that perform value-added activities and compete in the global marketplace. It can attract large employers, open up new opportunities for prosperity and raise their stakes for participation. The regions become a locus of economic development, with economic authority decentralized to the region and region to region relationship fostering regional networks. In today's world, global or regional value chain networks supplier and buyer are integral partners. Value chain and production networks weave together different specialized clusters, giving rise to a

network of clusters. For seamless trade, facilitation measures should be taken, aligned to international standards. It is like envisioning South Asia as a network of the region each playing a different role in the value chain and creating a win-win outcome for each other, leading to shared prosperity. Discussions beyond the traditional areas can be brought to prepare the post-COVID-19 era collaboratively.

The ongoing and expected changes will render South Asia an opportunity to become a new growth engine for the global economy. To shorten and diversify supply chains, companies will look for alternative or additional manufacturing bases. South Asia, with almost a quarter of the world's population, is an attractive location which can provide abundant and competitive labour forces. The region itself is also a vast market which is rapidly expanding with the increasing purchasing power of the people. In the course of reshaping supply chains, South Asia can seek an opportunity to upgrade its industry profile by attracting high

value-added industries. For this, human capital needs to be upgraded by strengthening skills, technical and vocational education and training, and higher education. The investments in human capital will not only result in higher wages for the citizens but also transform the economy into innovation and knowledge-driven economy.

The COVID-19 pandemic is still an ongoing crisis. Nobody knows when this crisis will be put to an end and how the new world will look like. However, the world is continuously changing bit by bit to cope with the COVID-19 and prepare for the new norm. Countries in South Asia should not fall behind in these changes, instead lead the changes by utilizing its strength and reinforcing its weakness. The new norm is coming, and the one who takes the first step will lead in the new world.

The views expressed in this article are those of the author and do not necessarily reflect the views and policies of the Asian Development Bank (ADB), its Advisory Council, ADB's Board of Governors, or the governments of ADB members.

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Indian Economy – The Challenges Ahead

Sarvesh Kaushal*

Since India gained independence in 1947, the Indian economy passed through various challenges. On the eve of independence, the size of its population was 360 million, and the literacy level was just around 12 percent. Presently, the population has touched 1.35 billion, and literacy level has jumped to 74 percent. Its GDP in 1950 was around \$30.6 billion. By 2020 beginning, the GDP rose to \$3.202 trillion. The Indian economy is now the fifth-largest in the world in terms of nominal GDP, and third largest by Purchasing Power Parity (PPP) (Mohan, 2020).

The Indian economy adopted different models for development over the years. During the 1950s, the main emphasis was on having a planned economy/mixed economy. Industrialisation began mainly in the public sector, and efforts were made to become self-sufficient in food grains production. Owing to those efforts, in agriculture India is surplus in food grains production. The second phase of the Indian economy started with economic reforms initiated during the 1980s and accelerated from 1990s onwards.

In these phases of development of the Indian economy, there is one other country, i.e. China that can provide a benchmark for comparison. In 1949, China's population was 540 million, and literacy level was 20 percent. In 2019, China had a population of 1.39 billion, and literacy is around 85 percent. Both India and China have significant reservoirs of human resources. The difference is only in types of government. In China, the government is centralised and coercive to achieve

targets, while it is democratic in India. Economic reforms started in both countries during the 1980s.

The third phase of the Indian economy started in 2014 with the present regime under the leadership of Prime Minister Narendra Modi. The government gave various energetic slogans and unleashed a new resolve to create a stronger economy. The NITI Aayog released in 2018 the 'strategy for New India @ 75', which is the corollary of Prime Minister's slogan "New India by 2022". The main message was to ensure balanced development across all the states with collective efforts and effective governance. The strategy covered as many as 41 sectors for balanced growth with few strategic priorities, and set the target of \$4 trillion economy by 2022 (additional 1 trillion of GDP in three years) (Aggarwal, 2020). During the COVID-19 pandemic, the PM gave another call of 'Atmanirbhar Bharat' (Self-Reliant India) movement supported by the 'Vocal for Local' (Goyal, 2020). The other slogans like Make in India, Digital India, DBT, and Clean India are meant to impact the economy in future positively.

Since the economy was noticeably suffering a slowdown in January 2020, the revised GDP growth estimates came downwards to 5 percent, which became a cause of concern. India's general government deficit, which was estimated at a whopping 7.5% to 9% of the Gross Domestic Product in 2019, is mopping up most of the net financial savings of the households, which are estimated at around 11% of the GDP. When the

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economy was not under stress, the gap between the combined deficit and total household savings was 6 to 8% of the GDP, which is now around 2%; and therefore, the private sector is comparatively starved of funds. (Montek, 2020)

Further, two immediate factors which impacted the Indian economy are, firstly, Covid-19 pandemic, and secondly, the prospect of India-China military face off spilling over to the realm of economics. To put things in perspective, in terms of per capita income, China is ahead of India. China is an upper-middle-income country. The per capita income in China is \$10,276 against \$2,104 for India. China and India are trading in large volumes, with India suffering a huge trade deficit.

In six months Covid-19 has already caused a slowdown in global economies. The cost of economic disruption caused globally by the pandemic has been estimated between \$9 trillion and \$33 trillion. The global consulting company McKinsey has emphasised that the cost of preventing future pandemics would be much less than the cost of suffering future pandemics. Rightly observing that the pandemic has exposed the weaknesses in the walls of infectious-disease-surveillance and-response capabilities, it rues that investments in public health and other public goods are solely undervalued; investments in preventive measures, where success is invisible, even more so. The attention should not shift once the pandemic recedes, thinking that the world is free to have its way for another one century till such a pandemic hits again. It is imperative to understand that this pandemic is neither the last one nor is there any guarantee that pandemics will not come with higher frequency. According to the report prepared by McKinsey, global spending of \$30-\$220 billion over

the next two years and \$20-\$40 billion annually after that could substantially reduce the likelihood of future pandemics.

McKinsey offers a candid caveat that these are high-level global estimates with wide error bars and that they do not include all the costs of strengthening health systems around the world. The wide gaps prevail on health expenditures as percentage of GDP across countries. In India, health expenditure as percentage of GDP is 3.5%, in China it is 6.5%, and in developed countries like USA, it is 17.7%. In India, the centre and state budget allocation to health is around 4-5% whereas other countries allocate around 8-10% of the budget to health care.

India's present GDP per capita is around \$2,104. China's per capita GDP is \$10,261, and that of the US is \$54,795. The Indian economy will have to move forward on a fast track. China's GDP was 5% of the \$GDP in the 1980s, but today it is almost 60% of the US GDP (Nominal). As per the World Bank classification, India falls in the lower-middle-class country with GNI per capita ranging between \$1026-3995, while China is an upper-middle-class country with GNI per capita ranging between \$3996-12,375. By way of an illustration of the objective ahead, the United States of America and a large number of other countries fall under the high-income countries group with GNI per capita more than \$12,376. India's share of world GDP is less than 4%, whereas it is around 15% in the case of China and 23.6% in the case of the USA. Indian economy needs a determined, consistent, big push to scale itself to a much higher and bigger operating economic platform and to come out of economic slowdown that emerged due to pandemic.

The COVID-19 pandemic, having inflicted direct disruption to production, supply chain, financial impact on firms and financial markets; unemployment; the stress of the banking systems due to the moratoria on repayments along with NPAs; a deadly blow to hospitality, tourism and transport sectors, combined with the essential cash and kind subsidies and doles to mitigate the pandemic stress on the poor in particular, and all sectors of the economy in general has the potential to put Indian economy in a tailspin. However, timely interventions by a decisive and a resolute leadership combined with the tenacity and fighting spirit of the Indian industries, in general, has the potential of converting the pandemic tragedy into a global opportunity to lead the other countries through a process of faster recovery.

India's tax to GDP ratio is around 10%; while most developed countries have tax to GDP ratio of 30%. Indian economy needs resources to strengthen the health sector leadership, healthcare financing, health workforce, medical products and technologies, information and research and service delivery, which is the WHO prescription for achieving the desired outcomes of the improved health level and equity, responsiveness, financial risk protection and improve efficiency.

Banking is the backbone of any planned economic resurgence. There has been a policy trend to undertake public expenditure by the government, either through direct spending or through facilitating bank credit for private investments. Although attention has been paid in the recent past to the non-productive assets accumulated in the banks, and some remedial measures are underway, there has been an indiscreet proportion of lending, at times without

adequate diligence, with the sole purpose of accelerating growth.

As growth in itself has become a politically flagged yardstick of achievement, the direct or indirect government ownership of the banks has contributed to dilute their essentially commercial and business-like operations. The public ownership has created an environment where market discipline is perceptibly weak, and where the regulators remain circumscribed. Over decades, investment entities, financial institutions and non-banking financial companies have been used to support vague and extraneous objectives underwriting the government's disinvestment targets, preserving employment in public enterprises, contributing assistance to states based on the political clout of the representatives, intermittently providing artificial support to stock markets, and occasionally ignoring lapses in due diligence.

Special attention is required to ensure sound health and reliability of the government banking sector, which needs to set up excellent benchmarks for private banks. However in India, it is the other way round. In public perception, the depositors are no longer as confident of the nationalised banks for the security of their deposits, as they used to be a decade earlier. It is interesting to note that between March 2018 and March 2019, when the safety perceptions got ruffled, the deposits in private banks exceeded those in the nationalised banks. As against INR 4.8 trillion deposits in private banks, the government banks secured only INR 2.3 trillion of deposits after netting out the deposits of IDBI upon its reclassification as a private bank. Even the foreign portfolio investors preferred private banks. However, the nationalised banks still

outperform the private banks in return of assets and return on equity (Patel, 2020). In 2019-20 the government infused INR 70,000 crore into public sector banks to boost credit for a strong impetus to the economy.

Thanks to an increasing realisation of the government about the need to tackle the burning issue of non-productive assets (NPAs) of the banks and emphatic insistence upon provisioning, there has been a reversion to the immensely needed working culture of securing the credit with strictest due diligence. During this pandemic time, many accounts would turn NPAs, especially those which were already in stress. Mergers and other administrative initiatives tend to increase the productivity of nationalised banks, which otherwise suffer from far lower revenue per employee as compared to their counterparts in private banking. It is a matter of grave concern that the amounts swindled through frauds have been ten times more in the nationalised banks as compared to their counterpart private banks.

It is excruciating, but a very welcome development for future reforms from the government, as well as the regulator. Reported cases of fraud of around INR 10 billion in 2018 multiplied exponentially thereafter (RBI-December 2019 Financial Stability Report UP 32), and the entire machinery has started the much-awaited sanitisation by getting after the cases of fraud hidden under the cloak of non-productive assets of the banks. This will hopefully make the banking sector emerge more robust anti-corruption measures. The troubled shadow banks saw signs of stimulus when the government in mid-May announced INR 3 trillion of collateral-free loans to the nation's small businesses and INR 705 billion

special credit loans to non-bank financiers.

Another moot point in public spending is that of the systemic leakages that take away a substantial part of the benefits that every unit of input must seek to achieve in the process of pump-priming the economy. Though bona fide and active initiatives have been taken, the leaking pipes have neither been replaced nor adequately repaired. The inevitable result is that more money is being pumped into the leaking pipes, and more the money pumped in, much more is the leakage. There is hardly any worthwhile quantitative comparison data between what the NITI Aayog has been able to achieve and improve upon and what the Planning Commission of India had lacked in the process of pumping funds into the leaking pipes operated both by the Centre as also by the States, which enjoyed substantial autonomy in operating the leaky system.

Like the rest of the world, the Covid-19 pandemic has struck at the roots of almost all market forces, throwing various ongoing trends topsy-turvy. A demand-driven economy substantially catering to domestic consumption has suddenly reversed into a surplus capacity economy with the market forces of demand suffering a free fall on account of curtailed consumption levels.

Nothing can generate more demand than a firm resolve towards creating an Atmanirbhar Bharat. "The five pillars of Atmanirbhar Bharat - Economy, Infrastructure, System, Demography and Demand are aimed with a bird's eye view on all the sectors and sections of society alike. Infrastructure, as an identity of the country; System, to bring in technology-driven solutions; Vibrant Demography; and, demand, tapping the demand-supply chain optimum utilisation of resources" (Yojana, July 2020). The Prime Minister has

announced a unique economic and comprehensive package of INR 20 lakh crore, equivalent to 10% of India's GDP, to support the five pillars of Atmanarbhar Bharat, calling upon the people to become vocal for our local products, and the industry to make the local products turn global in terms of production standards, quality and marketing.

Being self-reliant is critical for the growth strategy of Indian economy and to make it more export-oriented. Just taking note of India's trade flow with China for an example, the imports by India from China stood at \$73.3 billion, much higher than India's exports to China pegged at \$16.7 billion, leaving India's trade deficit with China at the staggering level of \$53.6 billion. The manufacturing sector in India could not grow as fast as compared to China and South Korea. In China and India, the economic reforms started during the 1980s onwards. During the period from 1961 to 2018, China grew by more than 10% in 22 years while India could never cross that mark even for a single year. The miracle of industrial growth happened in China by foreign direct investments in the selected regions on an experimental basis, the SEZs (Special Economic Zones) developed with foreign investments. Moreover, the state-owned enterprises at the local level of cities and villages known as TVEs linked to markets directly became ancillary industries. The labour laws became flexible and investments in the enterprises by the locals were encouraged. The legal system in China did not protect private property rights, and land acquisition is still not a hurdle as it is in India for setting industrial units. Gradually, the Chinese manufacturing sector shifted from labour intensive to capital intensive.

Much more worrying is the nature of India's imports such as capital goods like power plants, telecom equipment, steel projects; intermediate products like pharmaceutical APIs, chemicals, plastics engineering goods; and finished products like fertilisers, refrigerators, washing machines, air conditioners, telephones etc. Low-cost consumer goods meeting every human need at the micro-level manufactured in China have invaded the Indian markets and have given a severe jolt to the Indian traditional and modern manufacturing sectors.

In India, the manufacturing sector always remained under the protection of the state. High import tariffs, inflexible labour laws, protection to small industries and inefficiency in state-owned enterprises could not create a milieu for the development of a competitive manufacturing sector. The industry, with particular emphasis on SME, will have to shed its internal inefficiencies fundamentally caused by the complacent, unprofessional, and hereditary ownerships-cum-management. Time has come when the increasing international competition will not allow the industry the luxury it has enjoyed so far, of passing on the cost of its inefficiencies to the consumers, who opt for products with higher quality at a much lesser cost.

Efforts to make the Indian MSMEs (Micro, Small and Medium Enterprises) competitive globally leave much to be desired. MSMEs contribute as much as 30% of the GDP and hence become a top priority. Presently, one of the welcome steps to support viable MSMEs in the face of their destabilisation due to the Covid-19 pandemic is the Reserve Bank of India stepping in to restructure the advances to this priority sector.

With a liberal classification on August 6, 2020, raising the aggregate exposure limit to the borrower INR 25 crore as on March 1, 2020, with a few more conditions, RBI has stepped in to benefit their accounts which may have slipped into NPA category. Similarly, the RBI has allowed banks to reckon the funds infused by the promoters in their MSME units through loans under Credit Guarantee Fund Trust for Micro and Small Enterprises / Distressed Assets Fund as equity/quasi-equity from the promoters for debt-equity computation. Further, the Indian economy can leapfrog ahead of others by dint of a creative policy on innovation. India's Science, Technology and Innovation Policy of the year 2013 cater to the three pillars of talent, technology and trust, aimed at orienting public procurement towards innovative production.

India has a large population; some feel that it is a liability. A large population is not altogether a liability if it is converted into an economy's strength. It creates much consumption-related demand; and if made employable and productive, it creates a massive tailwind for the economy to push it to grow at a faster pace. The issue is squarely related to the productivity of our labour, and value-added per average labourer in the process of production, which adds on to the Gross Domestic Product. It is a matter of concern that the value-added per worker in India is just about 10% of a US worker. China's labour productivity in terms of value-added per worker is 2 ½ times more as compared to India. A two-pronged approach of skilling India's labour force and providing it with the requisite resources is a prerequisite to increase the value-added per worker, thereby increasing the gross domestic product of India. Pradhan Mantri Kaushal Vikas Yojna operated by the Ministry of Skill

Development and Entrepreneurship (PMKVY) has the potential of giving a quantum jump to the gross national product by increasing the productivity and value-added per worker far beyond the present levels. There is a dire need to upgrade the skills of the Indian labour force to international standards by involving the industry for developing the necessary framework, curriculum and quality benchmarks.

The prioritisation of relevant skills should be left to the industry for meeting their demand, with a clear idea on those skills which can have a catalyst effect and multiply productivity to a geometrical growth. Though the National Skill Development Corporation boasts of having trained more than 5 million students in India, the qualitative skilling evaluation would not only capture the total numbers but essentially the increase that it has caused in the value addition per trained worker as compared to an untrained one. The government of India has identified high priority sectors for imparting skills with an eye upon fast track results as a part of Make in India initiative, where the economy has still miles to go ahead.

Agriculture and allied activities are already areas of specific focus because even though the contribution of primary sector to the GDP has come down substantially over the years, still about 70% of farm households in India own less than 1 hectares of land, and about 85% of the farm households own less than 2 hectares of land. Livestock and other allied agricultural activities which are required to supplement the income arriving from core agriculture require a revolution to take the primary sector to the next higher level of productivity and value addition. Indian agriculture made rapid progress in terms of

production, but certain geographical constraints and lack of market orientation make it less competitive relatively to countries like China.

The Indian and Chinese agrarian economies are two ancient economies of the world. In both nations, a massive number of farmers depend upon agricultural income for survival. China has an advantage in irrigation when compared to Indian agriculture. India is the land of monsoons, where torrential rainfall is concentrated in a concise period of the year; whereas, in China, the average rainfall (at least in the more settled parts of the country) is somewhat more evenly distributed over the year. Reservoir storage of water supply in China for irrigation is almost five times that of India. Chinese agriculture productivity started improving since the 1980s when the shift came from collective farms to household responsibility farming. Chinese rice productivity is two times more than that in India. The share of agriculture in GDP in China is 7.11 percent, and in India, it is 15.4 percent. Percentage of persons employed in agriculture in China is 25.1, and in India, it is 42.39 percent as large inequality prevails in land ownership in India. (Bardhan, 2011)

For the production of high-value crops, contracts between farmers and corporates are more successful in India than in China, especially in dairy and food processing. Market liberalisation in agriculture came in China after de-collectivisation. The compulsory quota and procurement systems have been abandoned by the government. In India, recently at the time of the pandemic, special packages have been designed for the agriculture sector and certain legislations have been amended to make the market free from state control. The Essential Commodities Act is being amended to help the farmers generate higher incomes by

deregulating agriculture foodstuffs including cereals, edible oils, oilseeds, pulses, onions and potatoes etc. No stock limit applies to processors or value chain participants, with a few conditions, and further, it has been decided to impose stock limit under rare circumstances like national calamities, famine etc. as a price intervention by the state. The ordinances namely The Farmers Produce Trade and Commerce (Promotion and Facilitation) Ordinance, 2020, and The Farmers (Empowerment and Protection) Agreement Price Assurance and Farm Services Ordinance, 2020, have been promulgated with a focus on the rural economy. The implications of various initiatives envisaged through these legislations has evoked much interest and are being intensely debated by various stakeholders. The resistance to these amendments from the farmer unions in many states is a big challenge to the government.

The Indian economy has indeed made substantial progress in the field of governance through re-engineering of business processes, technology and data analysis. The CEO of NITI Aayog informs that the Direct Benefit Transfer (DBT) has been implemented across 437 schemes, and helped to save INR 83,000 crore till date. He further discloses that its implementation has led to 2.75 crore duplicate, fake or non-existent ration cards being deleted, and 3.85 crore duplicate and inactive consumers for Liquefied Petroleum Gas (LPG) subsidy being eliminated. Blockchain technologies can improve India's prospects at ease of doing business rankings, elimination and resolution of litigation arising out of contractual obligations, compromises in quality control, and others. The Goods and Services Tax (GST), though still under the process of stabilisation, has added

3.4 million new indirect taxpayers. There is an imperative need to focus upon the application of Artificial Intelligence in the fields of agriculture, health care and education in the Indian economy.

As the Indian economy gears up on a fast track of growth, the conflict between “development” and “environment” will surely become more intense. The central and state ministries of environment will have to play a far more proactive role to ensure that development and ecological concerns are balanced for not only increasing the GDP but also for ensuring long-term sustainability through a pollution-free life. “If development is about the expansion of freedom, it has to embrace the

removal of poverty as well as paying attention to ecology as integral parts of a unified concern, aimed ultimately at the security and advancement of human freedom. Indeed, important components of human freedoms-and crucial ingredients of our quality of life-are thoroughly dependent on the integrity of the environment, involving the air we breathe, the water we drink, and the epidemiological surroundings in which we live” (Dreze & Sen, 2013).

These are indeed challenging times. It is time for tough decisions, sound strategy, and a zero error implementation to be ahead of others in the changing global scenario.

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Application of Air Power in High Altitude Areas

Air Marshal Sumit Mukerji*

Introduction

The recent flare-up and unstable conditions along the length of the India-China border or the Line of Actual Control (LAC) have led to a spate of speculations and discussions on the goings-on and their future ramifications. Fuelled by an over-active, hyper Indian media, commentaries on the situation have virtually eclipsed those of politics and cricket matches, which generally hold center court. There seem to be more specialists in speculation than strategists who can paint the correct picture.

Notwithstanding the hype and holler, the ongoing confrontation between India and China could have serious consequences that merit deep introspection and definitive action. The unusual build-up of the People's Liberation Army (PLA) forces all along the India-China border, with a greater emphasis on Ladakh, does not predicate a routine skirmish between border troops but portrays an ominous portent of a sinister strategic plan. The issue needs retrieval, and means to manipulate it.

National Security

There are many factors that have led up to the morass that we find ourselves in. But the most important one is the basis of our strategic culture and strategic foresight. India is one country that

does not seem to capitalize on the factor of 'accrued benefits of experience' and exploit them to advantage. It is this one main reason why India has not been able to establish its National Security Strategy. Without a core direction, emanating at the highest level, it becomes impossible to create a culture or ethos among the population towards national security and infuse a sense of nationalism among the millions. History has recorded our callous and negligent approach to safeguarding our borders, therefore, our territory and sovereign integrity. The laid-back, servile attitude, born out of hundreds of years of subjugation and oppression by foreign rulers has inseminated an ethos or a mindset that suggests that we look at zealous aggressors as something that 'will go away' in due course.

The cutting edge or the sharp end that faces the effect of such historic debilitation is the armed forces. Sanctified by fire, literally and figuratively, at the turn of independence, the armed forces have bloodied their blade on five major occasions and have proven their mettle in many other skirmishes of lesser nature. Inhibited by an insular and non-aligned government, the armed forces have been aligned to protect the borders against two historical antagonists, China and Pakistan. Structurally designed to guard the land borders, the emphasis has been on a large ground Army, with a tactical Air Force to support it and a blasé attitude towards

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the Navy. Ego and turf wars between the three services have contributed to a mindset which does not permit growth or progress, thus relegating the Indian armed forces to perform less than optimally in a technology charged, high mobility environment, which is the essence of modern warfare.

Boots on the Ground

There is no gainsaying that ‘boots on the ground’ are a necessity in maintaining the security of our borders. With historically belligerent neighbors there is also the need that these boots remain dug-in and entrenched for 365 days in a year. The hostile terrain on our northern borders, is some of the most precipitous and difficult in the world. Stretching across nearly 4500 km, as one of the highest mountain ranges in the world, the Himalayas have the capacity to thwart anyone who dares to challenge its might. The unforgiving weather, with icy winds and temperatures plummeting to as much as -50 degrees is enough to deter man or beast. China has been progressively inching its way westwards and southwards, accessing footholds to eventually gain control of territory to claim as its own. Aided by a contested demarcation, loosely termed ‘Line of Actual Control’ (LAC), this imaginary dividing feature is indicative that it pushes well into recognized geographical borders and stretches across territory unashamedly retained by forceful occupation. The ill-gotten gains remain unreconciled and in a state of flux, offering opportunities to the belligerent to intrude and, over a period of time, stake claim. Since India has never fostered hegemonist views, it remains the passive recipient of intrusion by aggressors or infiltrators.

Strategic Significance Behind the ‘Stand-Off’

The necessity for the Indian Army to hold its ground to prevent infiltration has its own complications in this unforgiving area. Human endurance, maintaining morale, and motivation are a nightmare for the leaders and commanders. Provisioning of arms and ammunition, fossil fuels, communication facilities, food, clothing, and other supplies take on unprecedented proportions for the support services. The sheer effectiveness of the infantry soldier is entirely dependent on the back-up and re-supply. The means to deliver these goods will constitute the strategic backbone of the standing army.

This backbone consists of two channels. One is the surface infrastructure comprising roads, railway lines, bridges, tunnels, and secure stockpiling areas. The other channel is the supply by air, both by aircraft and helicopters. This facet of airpower, like the logistician, is little acknowledged but forms the vital link to the sustenance of those in some of the most inhospitable and inaccessible areas. The strategic significance of exactly this facet has triggered the recent face-off in Eastern Ladakh, between Chinese and Indian troops. The development and completion of the all-weather road connecting Darbuk-Shyok-Daulat Beg Oldie (DSDBO) have brought the Chinese to express their fears and concerns, indicating the significance of this particular logistical artery. The threat to the Karakoram Highway leading to the much-prized China Pakistan Economic Corridor (CPEC) has now become real and possible, exposing its vulnerability.

What has become intriguing is that the Chinese Western Theatre has deemed it (the DSDBO)

significant enough to try and deny its usage at their will, by physically dominating the road from commanding heights in close, visual proximity, which brings the supply route under direct fire. The next move would be to capture enough territory to lay claim to both the road and the airhead at Daulat Beg Oldie. While China's design is open to speculation, there is no doubt it has a larger plan in mind to annex more territory and facilitate a shorter route to reach the CPEC, through Ladakh. The noticeable change of posture is indicated by the amassing of an inordinately large number of troops in the immediate vicinity with a rather pronounced effect being projected by the presence of armoured vehicles, an unprecedented development. On the other hand, a look at the geography on China's side of the LAC clearly discloses the convenience of terrain for the development of military infrastructure. A far-sighted strategic perspective and a defined expansionist policy have contributed to China pumping in financial and industrial resources to develop the BRI and associated infrastructure in areas of strategic significance. Anticipating a military resistance to their designs of expansionist 'creeping' towards India, they have carefully planned and created a network of all-weather roads, with suitable supply points or nodes in the Tibetan Autonomous Region (TAR), virtually in our backyard.

The facilitation of logistics supply and armament movement in this terrain is remarkable by any standards. In contrast, the development of infrastructure on the Indian side can comparatively be termed 'pathetic'. The usual disregard for national security and its various implications, ignoring the feedbacks provided by the Army, and

not directing funds towards infrastructure projects in these difficult areas have all the hallmarks of a nation devoid of centralized direction with regard to national security, with no foresight, nor vision or strategy.

The Grey Zone of Uncertainty

The current incursion by Chinese troops is not a one-off incident, but rather it follows a pattern of small probes over random periods of time, essentially to find a path of least resistance, to establish themselves and subsequently claim as their own territory. Skirmishes range from arguments to fisticuffs to pushing, although the current one has taken on a bit of an ugly turn where precious lives were lost on both sides. Escalations hardly occur, but for the exception of two major occasions, one in 1967 at Nathu La and the other in 1986 in Sumdorong Chu. Both instances saw a reversal of result with respect to 1962, and the Chinese PLA incursions were beaten back most effectively, incurring heavy losses. The latter also saw the employment of airpower to great effect in this region.

This simmering situation is apparently a condition in virtual perpetuity with neither side willing (as yet) to get into an open conflagration. There are no clear lines in black or white, but rather the relationship remains in a festering grey zone of confrontation. There is no all-out war declared, nor does peace exist wherein the demarcation lines are given due respect, permitting troop withdrawal from the region. While Pakistan persists in waging irregular warfare against India by using terrorists to infiltrate, with China, India faces the sub-conventional situation of low-intensity conflict.

In the overall context, while China possesses

a larger standing army and a far larger air force, the asymmetry must be considered in the region of significance and the application thereof, or what forces can actually be employed effectively to bear upon the other. Given the region and the terrain, there is clearly one factor that can offset the asymmetry, and that is airpower. In terrain where mobility and rapid movement of forces in armoured vehicles is nigh impossible, it would be prudent for the Indian Army to resort to a holding battle and allow air power to provide the necessary application of force.

Air Power

Airpower has proven itself as the pivot that can turn the tide of surface warfare, both over land and water, so the proclivity to delay its effective utilization in the Indian context is not understood. Militaries the world over head into conflict with their Air Forces to soften the opposition and create avenues for the progress of the ground war. Therefore, the Air Force is prominently present at the planning of the land or a sea campaign. The sheer reach and span of the effectiveness of airpower means that it must be included and integrated from the inception of the planning process. The mobility and flexibility of airpower are the factors that overcome limited resources and therefore the air component Commander or the air elements need to have a holistic picture of each planned operation. This is considered absolutely mandatory for the Commander to distinguish and distribute his air power assets for effective application in the areas of interest. The want of this synergy and understanding could be the one fatal flaw in the ethos of our strategic military planning.

1962 will remain the last blot in the annals of independent India's military history. Emanating from a poor conceptual government appreciation for the need for a strong military, notwithstanding the struggle to retain Kashmir from infiltrators from Pakistan, the necessary mindset to safeguard our borders was lacking in the political firmament. The fearsome capability of the Indian Army and their highly acclaimed contributions in both the first and second world wars created the politicians' fear of the possibility of the military takeover, leading to the use of the provisions of the Constitution to subjugate the armed forces as much as the political leadership could. The ill-equipped and inadequately armed Indian Army suffered from the poor direction from the highest echelons and paid the price of ignominious defeat. Why the Indian Air Force was never employed has been a subject of great review and has provided a retrospective insight into what 'may have been' if offensive airpower was permitted to unleash its power with telling effect on the Chinese troops who would have been defenseless against this medium. As brought out earlier, the action at Sumdorong Chu in 1986 has driven home the proof that airpower can make the difference in a war in mountainous terrains.

Escalation Woes

The escalating ground situation and the unprecedented PLA build up in the TAR has sent a rather ominous signal to India. The lack of strategic perception and strategic surveillance has led to delayed perceiving of the development and direction of this posture. This is evidenced by the frantic reaction of the Indian Army rallying its troops and investing in large formations and mechanized forces to be inducted into the Ladakh

region. The government of India has also gone into high gear to acquire additional air assets to supplement the dwindling combat squadrons of the IAF—a long pending requirement. It is unseemly that it needed a crisis for basic strategic understanding to sink in and activate a system that has notoriously long gestation periods. The fast-tracking of the acquisition of additional fighter aircraft will still take some time for the items to be effective.

PLAAF – Strategic Transformation

The past three decades have witnessed a concerted thrust by the People's Liberation Army Air Force (PLAAF) to upgrade its combat airpower with the acquisition of state-of-the-art fighter platforms having a capability to carry out all-weather precision strikes. The information medium and real-time data transfer have permitted the PLAAF to create and operate in a network-centric environment, with the decision level also networked through complex Command & Control (C2) Centres. This environment has greatly enhanced the operating environment of its air power assets while at the same time, creating a more lethal atmosphere for opposing airpower.

The 1991 Gulf War had an immense impact on the Chinese leadership. The remarkable effect of airpower, which virtually won the war, brought into sharp focus, and highlighted the pathetic state of the PLAAF (in comparison) and China's air power. Operating redundant aircraft, with inadequate training status, and virtually non-existent international exposure, motivated the leadership to pursue a purposeful military modernization program. Following the direction given by the 2015 Chinese White Paper on 'China's Military Strategy,' which stated that "...without a strong

military a country can neither be safe nor strong," China capitalized on its soaring economy to fund its defense modernization program. Prominence was given to develop the PLAAF, both in numbers and technical superiority. Reneging on foreign partners by fair means and foul, China manipulated funds and efforts to acquire technology by any means available.

Thus, the strategic transformation of the PLAAF commenced, with a stated purpose of modernizing and integrating its air and space forces and accelerating its transition from a purely territorial protection AD force to one capable of both defensive and offensive operations. With its well laid out Military Strategic Guidelines (MSG), which provided the 'basic principles of planning and guiding the conduct of the war in a modern military environment,' the PLAAF set out to layout its priorities for strategic transformation. These included:-

- (a) Effective Air Superiority capability.
- (b) Suppression of modern Air Defences.
- (c) Develop a modern, integrated AD Network.
- (d) Develop Long-Range Strike capability.
- (e) Develop efficient Medium and Heavy lift capability through a robust transport fleet.
- (f) Develop C4ISR through Satellites, Airborne Warning And Control System (AWACS) & Airborne Early Warning and Control (AEWC) assets.
- (g) Procure tankers for strategic tasks.
- (h) Modernize and enhance the indigenous military industry.

Technology acquisition has resulted in the PLAAF procuring and manufacturing some of the most modern fighter platforms today. China's

proclivity for reverse engineering, not to mention the misappropriation of plans and designs from foreign Original Equipment Manufacturers (OEMs) through dubious means, has benefitted the military industry. All this has resulted in China today possessing a state-of-the-art, lethal air force with a capability spectrum stretching through the air, maritime, space, and information domains. Copying the USA's 'Net-Centric Capability' maxim, China has adopted the term 'Informatization' to describe its transformation into the realm of digitized warfare. Because training and doctrine were the weak areas in the PLAAF growth chart, concerted efforts to reach out have allowed them to participate with Pakistan, their strategic partner, in Air Warfare Exercises, which have been progressively increasing in complexity. Pakistan Air Force, which participates in exercises with many other Air Forces, brings to the table a host of experience that will prove immensely beneficial to the PLAAF.

PLAAF Capability

(a) Fighter Aircraft. While the PLAAFs fighter aircraft arsenal is impressive, comprising SU-27, SU-30 MKK, SU-30 MK2, SU-35, J-10, J-11, J-15 (from the SU-33), J-16, J-20, and the developing J-31 in considerable numbers, extolling their performance and capabilities will only be effective when seen in the context of the region of employment. The sheer elevation of the Tibetan plateau and the inhospitable climate for a more significant part of the year precludes the effective utilization of these sophisticated platforms. The limitation imposed by altitude on airplane engines, both jet and piston engine, is a simple case of debilitation in performance. The rarified

atmosphere is not conducive to producing the suitable 'composition,' which allows these engines to operate optimally. The resultant loss of performance grossly impinges on the operational impact of these otherwise impressive weapon platforms. Restricted by take-off weight, aircraft have no choice but to forfeit either fuel or weapon load. Both are severe operational limitations. Freezing of fossil fuels/greases imposes further operating limitations in specific temperature conditions. Longer take-off and landing distances take their toll on tires and braking systems. Associated infrastructure like runways need to be longer, and the severe temperatures put building material and structures under severe stress, reducing their life spans. Thus, the sparingly created military airfields in the Tibetan Autonomous Region (TAR) are devoid of suitable infrastructure to support protracted operations. Until recently, they hosted fighter aircraft only in small detachments for brief training sojourns.

(b) Helicopters. A matter of more in-depth consideration and attention should be the deployment of PLAAF helicopters and UAVs in the region. While helicopters' effectiveness will suffer because of ambient altitude, their effectiveness in negotiating the terrain and their access to troop support will play a major role in the region of operations. The PLA and the PLAAF have a fleet of Mi-8 / Mi-17 helicopters acquired from Russia, with a large back-up of indigenously built helicopters. The main backbone is the Changte Z-8, while they also have the Z-9 (Dauphin derivative), and the newly developed Z-20 (a clone of the US Blackhawk helicopter). China has invested heavily in the development and manufacture of Z-10, Z-9W and Z-19 helicopters,

all of which attack helicopters of differing weight and capability, with associated firepower. It was reported last year that the Z-10 and the new Harbin Z-19 and Z-20 helicopters participated in a significant multi-grouping and multi-dimensional army support exercise. Equipped with state-of-the-art glass cockpits, NVD (Night Vision Device) capable and networked with sensors like satellites / AWACS / UAVs, the helicopters, in close support role, were able to “see over the hill” well before they approached the targets, giving them the flexibility to orientate themselves to the real-time battle scenario and plan their attack and getaway optimally in a high threat zone. The report concluded that the attack helicopters were very effective during the exercise.

(c) Rocket Forces. Perhaps the biggest airpower threat emanating from China that should concern us the most is their missile and rocket forces. Because of the limited capability that fighter aircraft could bring to bear in the region of conflict with India, China will probably lay greater emphasis on containing India’s air power by attempting to deny their use through pulverising attacks on IAF airbases with their missile and rocket forces. Supplementing the surface to surface missile and rocket force will be the ALCMs (Air-Launched Cruise Missiles) carried by the H-6K bombers of the PLAAF. Operating from depth airbases, utilising tanker support for air to air replenishment, the H-6K bombers could launch the Changjian-20 (CJ-20), an Air Launched Land Attack Cruise Missile (AL-LACM), which has an estimated range of 2000 kms. The warhead could be conventional or nuclear. Designed with inertial, GPS and terminal radar guidance, it is reported to possess a CEP of 5m, in other words, a precision strike

weapon, normally used for strategic strikes on Centres of Gravity.

The Indian Air Force

The Indian Air Force has a well-established array of airfields confronting China. Stretching from Leh in the north, through the bases in Punjab, UP, Bihar, West Bengal, and Assam, every airfield is capable of full-fledged operations for all types of aircraft. In fact, they have a well-developed infrastructure that meets all possible necessities other than some specialist requirements specific to a particular type of aircraft or its weapons. The necessity for adequate air power to counter China in conflict across a 4500 km frontage highlights and brings to focus the consequences of delayed acquisitions for the IAF in the light of a dwindling inventory. This takes on a grave portent when it becomes necessary to offset the threat on the western front, simultaneously. The flexibility and mobility of airpower will permit the IAF to shift its assets across the frontage at will, based on the threat and requirements. While the total fighter aircraft assets may be able to cater for all sectors, these numbers do not cater to likely attrition if used in an offensive role. Like the PLAAF, the IAF in this scenario is also likely to be mainly utilized in close support to the army in conducting Battlefield Air Strikes (BAS) and Interdiction, both shallow and deep, to deny the PLA its logistics. Extensive use of helicopters would see the platforms undergoing high utilisation, providing the Army support in various roles, such as an attack, redeployment of troops, and casualty evacuation in the battle zone.

While the criticality of numbers of fighter aircraft is regularly talked about, in a crisis of this

nature, the criticality is probably higher with respect to the availability of High-Value Airborne Assets (HVAAAs) like the AWACS, AEW&C and FRA (Flight Refuelling Aircraft). If mobilisation and transfer of assets from one theatre to another is necessitated in a full frontage war, the lack of adequate force multipliers may become a factor that would decide success or failure. The IAF is woefully short of these assets in such a scenario.

In response to China's missile and rocket force, India must make full use of its own indigenous firepower in this domain of Surface to Surface Missile (SSM) warfare. With our Prithvi series of SRBMs (Short Range Ballistic Missiles) covering distances of 150-600 kms, the Agni series of IRBMs (Intermediate Range Ballistic Missiles) covering distances of 700-6000 kms (The Agni V is an ICBM – Inter Continental Ballistic Missile – range 5000-8000 kms) and the new Shaurya 700-1900 kms range MRBM (Medium Range Ballistic Missile), we have a fairly effective coverage of likely targets in China. The latest range of Surface Launched Cruise Missiles (SLCMs), the supersonic Brahmos (290 km), Prahaar (150 km), Nirbhay (1000-1500 km) have brought into sharp focus our precision strike capability with land-based missile systems.

Operational Imperatives / Analysis

The recent border conflict and the on-going impasse may not coalesce into a full-fledged war between India and China. Not willing to face a repeat of the ignominious result of 1962, India must take all measures to ensure that the results are like those achieved in 1986. The circumstances today are far different, one would assess, but given the extent of China's threat posturing and the

ominous accretion of PLA forces as India's opposition becomes firm, the situation could precipitate into an India-China conflict. Limitations of terrain and the fact that China, like India, is faced with another possible contested front (South China Sea), will mean that the China's Western Theatre Command will be solely responsible to exercise its authority to oversee operations across the entire frontage. As brought out earlier, limitation of operations by PLAAF aircraft in the TAR and associated regions indicates that fewer than optimal air assets can be employed in the area. The likelihood of large-scale air attacks is therefore negligible, if not, obviated. China's highly acclaimed Peoples Liberation Army Rocket Force (PLARF) is likely to be at the forefront of the battle zones, unleashing a preponderance of SSMs / ALCMs to suppress IAFs air power from coming into effective play.

China's fighter aircraft are likely to be restricted to air defense duties to protect its own VAs / VPs, carry out close support missions on as required basis in their territory, and attempt shallow and sporadic interdiction missions into Indian territory. In pursuit of its modernization process, China has built up a highly effective layered Air Defense system, designed to create a dense, protective, and lethal environment for any intruding aircraft. These AD assets are reportedly well integrated into a modern 'informalized' network providing a highly responsive and effective defensive structure. This will prove to be a significant deterrent to IAF aircraft which seeks to infiltrate deep into Chinese territory. AD systems are likely to be deployed in the mountainous region of the immediate area of confrontation.

The fact that airborne airpower is decidedly

in India's favor will not be lost on China. India needs to be up to speed to offset the onslaught of rockets and missiles that are virtually guaranteed to precede any major ground operations. Effective passive air defense measures, creation of infrastructures like hardened shelters and dissipated deployment of assets will offer safety. The vulnerability of HVAAAs operating among the forward airfield zones/airspace will have to be critically assessed, and the HVAAAs exposed for the minimum possible periods on the ground. This would be true for the transport fleet of C-17 / C-130 / AN-32 aircraft that would be on a continuous supply chain replenishment duty. The factor of exposed aircraft to rocket and missile attacks will be critical for our helicopters operating out of our forward bases and ALGs. Helicopter support in mountain warfare is invaluable, and degradation will have catastrophic consequences, imposing severe limitations on-ground operations. China has created the PLA Airborne Corps, whose tasks are air and airborne assault, by paradrop and assault landing, respectively. Designed to support the main force thrust to seize and secure vital areas, they pose a huge threat to our forward airfields like Leh and Daulat Beg Oldie (DBO). The forward airfields are lifelines for Army re-supply and sustenance.

History Begets Caution

The employment of airpower in high altitude mountainous terrain was classically exemplified by the Soviets and Americans in Afghanistan, albeit in different periods of time. Some of the crucial lessons that emerged which are of significance and should be carefully studied and considered by our planners are enumerated below:-

- (a) Weather in mountainous terrain is unpredictable. Severe turbulence / poor visibility can hamper operations. Weather affects targeting, even by LGBs.
- (b) Effective attack directions are restricted and predictable, increasing the threat envelope for attacking aircraft/helicopters.
- (c) Small and dispersed targets in vertically oriented terrain make accurate engagement difficult.
- (d) Degraded performance of aircraft at high altitude, especially helicopters, make them vulnerable to anti-aircraft weapons.
- (e) Specialist training for pilots is considered necessary because of the specific peculiarities that operations in mountainous terrain present.
- (f) The strategic struggle of warfare in such terrain is to try and strangle the enemy's logistics chain. Interdiction will pay dividends.
- (g) Forward Air Controllers (FACs) play a vital role for effective air attacks, especially in terrain where targets are difficult to discern.
- (h) The Soviets lost a lot of aircraft and helicopters to ground fire – they were forced to resort to long-range weapons to reduce attrition.
- (i) The US' Op Anaconda was a huge disaster in which they lost several Chinooks, Blackhawks, and Apache helicopters. Only nations like the USA and Russia can absorb such tremendous losses.
- (j) Both Soviet and American helicopters fell prey not only to Low-Level Quick

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- Reaction Missiles (LLQRM), but even to RPGs and heavy caliber small arms.
- (k) ISR and updated intelligence were vital to every operation. UAV's are a vital asset but are quite vulnerable.

Conclusion

The possibility of an India-China conflict in the light of the recent skirmish and the saber-rattling that is in progress cannot be ruled out, and India cannot be found wanting under these circumstances. There is no doubt that air power will play a dominant role in shaping the war in the given area of operations. In the event of a major conflict, a comparison of capabilities clearly highlights the woeful state of the IAF's airpower resources when confronted with even limited assets across the border. As long as the conflict is swift and short, our limited assets will be able to sustain; but a protracted exchange

will dramatically wear out an over-stretched force. In every eventuality, China's missile and rocket force capability must be of concern to our planners. UAVs have not been elaborated upon because of the wide variety that can be operated. They contribute as a significant airpower asset in support operations to ground forces.

The procrastination seen for decades in defense acquisitions highlights a lack of understanding in India's bureaucracy and political establishment of defense requirements to combat a hostile neighbor. Political and diplomatic maneuvers by themselves cannot guarantee peace in the absence of hard power alternatives, which simply suggests the need to maintain a strong military. It is hoped that the existing resources serve the purpose and prove their potential if full-scale hostilities ensue. Only time and history record the successes and failures of military confrontations.

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Science of Biological Warfare and Biopreparedness

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Introduction:

Germ warfare refers to activities that intend to induce mortality and morbidity of living beings by the application of bacteria, virus, fungi and their derivatives. Advances in the field of biotechnology have opened new avenues for the development of airborne, highly dispersible lethal biological weapons that may cause the death of millions of people. The SARS-CoV-2 virus which originated in Wuhan, China and caused global pandemic has led to speculation about the origin of the virus and the possibility that the virus has laboratory-based origins. While the use of biological weapons in war is not new, the impact of biological warfare on societies would be devastating. Besides state actors, such weapons falling into the hands of terrorist groups and militant organisations would also pose serious security challenges across the globe, with unimaginable consequences. This article aims to discuss the scientific and biotechnological prospective of biological agents and various microorganisms and the molecular mechanism of their potential candidature as bioweapons.

Biological weapons (BW) are weapons which contain replicating infectious and lethal forms of life including bacteria, viruses, fungi, protozoa, prions, or poisonous chemical toxins produced by living organisms. They have a strategic and technical advantage in wars because of their easy availability, low production costs, easy transportation and dispersal, and non-detection by

basic security systems. These biological warfare agents (BWAs) multiply in the host and get transmitted to other individuals leading to a widespread disease with high morbidity and mortality. These disease-causing biological agents have been used to degrade combat capabilities of enemy forces at the war front. In the last few decades, several incidences of bioterrorism and biological warfare research and development have been recorded. As the world witnesses rapidly evolving geopolitical power shifts and competition, some countries, despite being signatory members of the 1972 Biological and Toxin Weapon Convention (BTWC, 1972) have started showing interest in biotechnological, genetic engineering and synthetic biology tools to develop highly potent and deadly chimeric biowarfare agents. Extensive covert research is getting established under vaccine and enzyme development programmes to modernise and weaponise the genetically engineered human pathogens to develop highly contagious strains that would defeat all the barriers of immune systems and current medical treatments. These researches include weaponising highly contagious, antibiotic-resistant recombinant novel strains and synthetic chimeric viruses to aerosolise and develop powder formulations for direct loading into munitions and cluster bombs.

Next Generation Biological Weapons

The technical application synthetic biology and

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genetic engineering tools can be strategically misused to transform harmless bacteria and viruses into lethal warfare agents with enhanced infectivity, pathogenicity, virulence, survivability and drug resistance. Political and military leaderships need to be made cognizant of the risks, threats and the impact of offensive biotechnological warfare attacks by potential state/non-state bio-terrorists, so that response activities for early prevention, detection, assessment, rapid response and recovery can be implemented.

The biowarfare agents are classified into six major groups¹:

- i. **Binary biological weapons:** This includes a dual component system, consisting of a pathogenic host strain and a plasmid bearing virulence genes. These are first individually propagated at a large scale and then mixed for transformation within the munition, acting as a bioreactor and subsequently deployed as a bioweapon. This technique can be misused to enhance the virulence of human pathogens, causing anthrax, dysentery and plague etc.
- ii. **Designer genes:** Decoded and available whole-genome sequence data of pathogenic microorganisms, advanced genetic engineering tools and techniques can be misused to design, reconstruct desired virulence genes for creating novel lethal pathogens.
- iii. **Designer diseases:** Advanced molecular and cellular biology understanding can be misused to create designer pathogens to develop designer diseases with desired symptoms of a novel hypothetical disease. Somatic or germ cells can be targeted through inducing immune suppressive effects or inducing apoptosis,

enhanced cell proliferation causing major tissue or organ system destruction.

- iv. **Gene therapy based bioweapons:** Retroviruses can be misused as vectors to introduce the desired gene in mammalian cells. These viruses integrate into the human genome while overcoming all the barriers of the natural defence system of the human body.
- v. **Host swapping diseases:** Zoonotic diseases where a pathogenic virus has a natural animal reservoir can be swapped to humans through codon manipulations. Animal viruses can be humanised by genetically modifying to utilise preferential human codons.
- vi. **Stealth viruses:** Viral agents bearing human oncogenes can be illicitly transferred to human genomes. Exposing stimulus to initial dormant transduction can activate oncogenic determinants present on the stealth viruses which can destroy the human population.

Construction of synthetic infectious agents

Living systems can be engineered with novel pathways by redesigning natural biological processes using synthetic biology tools. Whole-genome sequence data can be used to artificially synthesise, design, reconstruct virulent effector elements and genes with requisite pathogenicity to create infectious dwarfed genomes or genomes resembling natural human pathogens (for example synthesis of bacteriophage and mycoplasma genome). The first artificial bacteriophage, ϕ X174 of 5386 bp genome was synthesised and stitched to produce biofuels². T7 bacteriophage of 39,937 bp genome was redesigned by refactoring to

generate chimeric bacteriophages by removing and replacing genetic segments maintaining replicative and functional activities³. Systematic mutagenesis researches helped in understanding the minimal genome content essential for maintaining cell viability and supporting cell replication for *Mycoplasma genitalium*⁴. The study led to the synthesis of the first dwarfed 582,970bp genome of *Mycoplasma genitalium* and construction of a slow growing *M. genitalium* to a synthetic, prolific designer strain *M. mycoides*⁵.

Synthesis of native or chimeric viruses: Synthetic virology tools assist in the construction of chimeric viral genomes with designer elements, in-vitro phage assembly, and development of efficient delivery systems.

- i. **Synthesis of the 1918 Spanish flu virus:** Gene sequencing and RT-PCR technique was applied to reconstruct the first genome of the 1918 Spanish Flu from eight viral RNA segments recovered from lung tissue autopsy samples of pandemic victims⁶. Later using reverse genetics, the first synthetic virus was constructed. Different variants were reconstructed and studied for factors contributing to the severity of the disease, antigens and glycoproteins for attachments, mutations linked to epidemics in humans and birds, components of viral capsids required for assembly etc.⁷
- ii. **Synthesis of poliovirus:** First artificial poliovirus was constructed using cDNA synthesis. Twenty-five different mutations were investigated in cell lines and animal models for infectivity, pathogenicity, virulence and oncological features associated with the viral genome⁸.

iii. **Synthesis of human endogenous retrovirus (HER):** HERs includes a class of degenerate human retroviruses that infested human genome million years ago. Using synthetic consensus sequence and site directed mutagenesis, infectious proviral particles of HERV were generated⁹. Further, using whole-genome synthesis, another proviral clones of HERV were generated and studied for infection on human cell lines¹⁰.

iv. **Synthesis of the human immunodeficiency virus (HIVcpz):** Viral nucleic acid strings were isolated from faecal samples of wild chimpanzees, and by deriving consensus viral sequences an artificial simian immunodeficiency virus (SIVcpz) was synthesised. This was further used to produce infectious molecular clones of immunodeficiency virus and investigated for cross-species transmission and host adaptive responses to viral infections¹¹

v. **Synthesis of SARS-like coronavirus:** Severe acute respiratory syndrome virus coronavirus (SARS-CoV) and artificial clones of SARS-CoV were created by exchanging the receptor-binding domain (RBD) with that of human SARS-CoV capable of infecting human cell lines and animal model mice.¹² The repertoire of acquired research on human adaptation, virulent genetic loci and assembly of the designer pathogen can be misused to design deadlier viruses and pathogens.

In vitro packaging of viral genomes

Arming DNA synthesis, and sequencing technologies in the genetic engineering arsenal

have advanced the construction of the whole genome of viruses with desired pathogenic properties. Biological understandings of host-pathogen interactions, mechanism of infection, detailed mechanism of the packaging of viral genomes can be used to synthesise host-specific chimeric constructs with enhanced infectivity. Researches are accessible which are used for in vitro packaging of chimeric viral genomes for the assembly of infectious viruses.

All the researches shared above are published on various web research portals with experimental details and protocols which are accessible internationally. The initial intent of these studies is to use biotechnology for saving lives by understanding the mechanism of host-pathogen interaction for the development of vaccine, antimicrobials, therapeutics, biofuels etc., but the threat & risks associated with dual-use remains. The biodefense, biological security strategy and associated preparedness measures starts when the associated dual risks are understood, and the understanding is advanced and a step ahead to proactively prepare and engage in countering, preventing, mitigating the threats associated.

Technologies and Strategies for Biowarfare agent detection

Biowarfare is an evolving and emerging national and global security threat with a potentially catastrophic economic, psychological, and social impact. To counter this, several countries have proactively established their comprehensive biodefense institutions and security strategies to strengthen early and efficient detection, protection, and decontamination of biowarfare agents¹³.

Advanced molecular and microbiological sensing techniques such as antibody-based immunoassays, cellular fatty acid profiling, flow cytometry, nucleic acid-based detection, mass spectrometry, microbiological culturing, and genomic analysis can be used for primary identification of biological agents. Efforts are being made across the globe for the development of highly efficient, reliable, sensitive, and selective technologies and system for detection and identification of BWAs.

Major technologies available for detection include:

- i. Microbiological culturing:** Micro-biological culturing is the conventional, highly reliable and specific method for the isolation and identification of biological agents such as bacteria, fungi, and viruses. Microbes are cultured on selective media, and viable microbes can be studied for morphological and biochemical characterisation.
- ii. Flow cytometry:** This technique involves the scattering of laser light and emission of fluorescence by excitation of dyes linked with bacterial cells. Fluorescently labelled monoclonal antibodies are used for detection and identification of various Biowarfare agents such as *B. anthracis*, *B. melitensis*, botulinum toxin, *F. tularensis*, and *Y. pestis*.^{14 15}
- iii. Cellular fatty acid-based profiling:** Bacterial strains can be identified based on the variability of their fatty acids structures and profiles. Cellular fatty acids are converted to fatty acid methyl esters which are analysed by gas-liquid chromatography. GC chromatograms generate fatty acid fingerprints that are specific and employed for the

identification and characterisation of various biological agents such as *B. anthracis*, *B. mallei*, *Brucella*, *B. pseudomallei*, *F. tularensis*, and *Y. pestis*.¹⁶

- iv. PCR based detection:** This molecular biology technique is sensitive and rapid for identification of biowarfare as compared to conventional microbiological techniques. Polymerase chain reaction (PCR) is used to identify an organism based on the presence of specific DNA sequence(s) in the organism. PCR-based identification has been reported in the case of various biowarfare agents such as *B. anthracis*, *C. burnetii*, *filoviruses*, *F. tularensis*, *Y. pestis*, and chimeric viruses such as Zika virus, yellow fever virus, Ebola virus, and Mengla virus.¹⁷
- v. Immunological methods:** This technique is based on antigen-antibody interactions for identification of BWAs. The cell surfaces possess specific antigens to which antibodies bind and form a detectable coloured complex. Enzyme linked immunosorbent assay (ELISA) for example, is used for the presence or quantitative detection of antigens present on the agent. It is efficient, economical and readily employed for the detection of biowarfare agents such as *B. anthracis*, *B. pseudomallei*, *B. mallei*, *Brucella abortus*, Ebola virus, *F. tularensis*, Marburg virus, toxins, and *Y. pestis*.¹⁸ Fluorescent microscopy can be used, where a fluorescent labeled antibody is attached to bioantigen present on the surface of the agent. Immuno-histochemical based methods have been used to detect CHKVs¹⁹. Other, hand-held immuno-chromatographic

assays (HHIAs) performed on nitrocellulose or nylon membranes, based on lateral flow immunoassays can be used to detect *B. anthracis*, *B. abortus*, *B. pseudomallei*, *botulinum*, *F. tularensis*, smallpox virus, Ricin toxin, variola virus, and *Y. pestis*.²⁰

- vi. Next-generation sequencing (NGS):** NGS techniques are highly specific and rapid can be used to sequence multiple DNA fragments of bacterial and viral BWAs from clinical or environmental samples simultaneously. This technology has been tremendously used in diagnostics development, for identification and differentiation of novel infectious agents. NGS has been used for *B. anthracis* and *Y. pestis*. *F. tularensis* detection in human clinical samples of unknown etiology.²¹
- vii. Bio-sensors:** These are analytical devices that generate an electrical signal when interacting with analyte present in BWAs. The biological response produced is converted to a detectable form by the transducer, which marks the presence of any biowarfare agent in the sample. Biosensors are highly specific, selective, efficient in electrochemical detection of biowarfare agents. Immuno-biosensor consisting of bismuth nanoparticles (BiNPs) has been developed for anthrax PA toxin detection in a particular sample.²² Other electrochemical immunosensor includes gold and palladium bimetallic nanoparticles, genosensor loaded with gold nanoparticles, and gold nanoparticles and graphene transducer etc.²³
- Surface plasmon resonance (SPR) is another rapid and specific technique that has been reported

for detection of BWAs like *B. anthracis*, botulinum neurotoxin, *Brucella*, *Staphylococcus enterotoxin*, and *Y. pestis*.

Piezoelectric biosensors have been developed for detection of *F. tularensis*, and *staphylococcal enterotoxin A* in milk samples.²⁴

Bio-preparedness against next-generation biological agents

Bio-preparedness against BWAs includes the development of effective and safe preventive and treatment measures against infectious diseases. Biotherapeutics includes vaccines, chimeric proteinaceous toxins, specific proteins, oligonucleotides, ribozymes, peptide based drugs and RNAi based antivirals which by blocking viral entry, inhibiting viral replication, cleaving target RNAs and inhibiting mRNA translation selectively killing the infected cell.

Chimeric or designer viruses as candidates to develop a vaccine

Chimeric viruses are efficient, affordable candidates for the development of vaccines against contagious viruses. The dual potential of the chimeric virus as a biotherapeutic or biological warfare agent is a covert and overt challenge. Few examples of chimeric viruses to develop vaccine:

- **Chimeric Zika virus (ZIKV):** Zika virus is a single-stranded RNA virus transmitted by *Aedes* mosquitoes which causes congenital neurological complications. Recently, a chimeric virus was constructed by swapping antigenic surface glycoproteins, and capsid anchor of yellow fever virus with the corresponding sequence of pre epidemic ZIKV

isolate¹. Various tissue culture adaptive mutants were made and tested in mice model. In the same year, another group constructed chimeric Zika virus strain which was integrated into yellow fever virus attenuated backbone. The chimeric strains were investigated for Neuro-invasiveness in cell line and animal model.²

- **Chimeric West Nile virus (WNV):** West Nile virus causes infection in blood samples of vertebrates. A chimeric virus was prepared by coexpressing Dengue serotype and West Nile³³ Huang, C.Y.-H., Silengo, S.J., Whiteman, M.C., Kinney, R.M., 2005. Chimeric dengue 2PDK-53/West Nile NY99 viruses retain the phenotypic attenuation markers of the candidate. This vaccine construct was investigated for mutations to improve immunogenicity and viability.
- **Chimeric Chikungunya Virus (CHIKV):** A chimeric CHIKV vaccine was constructed by using three recombinant viruses as the backbone, i.e., sindbis virus, vaccine strain of Venezuelan equine encephalitis virus, and eastern equine encephalitis strain expressing CHIKV structural protein genes.⁴ This chimera developed immunogenicity and robust neutralising antibody response in both immunocompetent and immunocompromised mice model. More chimeric vaccine candidates were prepared using structural genes of CHIKV and nonstructural protein genes of Venezuelan equine encephalitis virus. The chimeric constructs were less infectious in CHIKV vector *Aedes aegypti* with lower dissemination as compared to the wild strains.⁵

Decontamination technologies

Traditional decontamination systems to minimise adverse effects caused by hazardous biological agents include bleach and decontamination solutions. Localised small-scale remediation can be done using decontaminant solutions such as hydrogen peroxide, chlorine dioxide gas dissolved in water, phenolics, sodium hypochlorite, and quaternary ammonium compounds, or decontamination foams. Large-scale remediation can be done by fumigating with chlorine dioxide gas. Other tested and reported decontamination agents include ethylene oxide, glutaraldehyde, hydrogen peroxide vapour, peracetic acid, ortho-phthalaldehyde, ozone, and para formaldehyde. The alcohol solution is useful for hard nonporous and 70% alcohol solution decontaminates almost biological contaminants.⁶

Autoclaving, dry heat, thermal washer disinfection, ultrasonication and sterilisation are other commonly used decontamination procedures. Ionising and non-ionising radiations, thermal energy, and reactive gases produced by plasmas can also be used for the decontamination of biological agents.⁷⁷ Raber, E., Jin, A., Noonan, K., McGuire, R., Kirvel, R.D., 2001. Decontamination issues for

A portable arc-seeded microwave plasma torch for decontamination of BWAs is available.⁸ Highly reactive plasma in a highly energised state effectively oxidised and destroyed all the biological agents. Vacuum cleaning with HEPA filtration is also an effective decontamination method which reduces the particulate load to allow effective remediation.⁹

Development of novel decontamination systems against biowarfare agents with a key focus

on practical, economical, fast, nontoxic, and specific decontamination should be prioritised. Ideal and eco-friendly decontamination technologies that focus on selective and effective disinfection of biowarfare agents are still in the infancy stage.

Conclusion

The strategic use of technology like bioweapons can be camouflaged as a natural outbreak of diseases with the capability to destroy human population, livestock and crops and cause other economic damages. The dual potential of advancing genetic engineering and synthetic biology can be exploited for the synthesis of next-generation bioweapons, eventually increasing the risk of biological warfare. All critical biological data such as decoded genome sequences of pathogenic bacteria and viruses are accessible through various national and international depositories. Researches on essential genes, virulence factors, or synthetic constructs with humanised infectious elements are accessible, which can be misused to develop designer genes, designer disease and next-generation bioweapons for bio-terror attacks. At present, global biodefense technologies for detection, protection, and decontamination are limited. There is a massive gap in knowledge, technology and strategy for preparedness which needs attention.

The scientific community must proactively engage for competent and dedicated scientific collaboration required for the rapid development of biodefense solutions to counter any probable biological attack. Sharing of scientific knowledge within the scientific communities is the critical pillar of safe scientific development. Reported

incidences and evidence indicate an asymmetric correlation between offensive and defensive biowarfare strategies. Domestic laws against the use of bioweapons need to be enacted. The Biological and Toxin Weapon Convention (BTWC) needs to be strengthened through a legally binding instrument. Strict vigilance, enforcement and compliance of the provisions of the BTWC, the dedicated national portal for bio-surveillance and extended bio-intelligence network for information exchange between the countries is needed. It is essential to develop a national decision theatre and

a dedicated wing in civil and military administration for biodefense and health security network. Developing specialised biodefense laboratories, promoting community immunisation program and awareness campaigns are the key initiatives for effective management against biological incidents and catastrophes. A comprehensive national biodefense strategy needs to be developed and operationalised to support the nation's ability to proactively prepare and develop essential defensive tools such as diagnostics, vaccines, antibiotics and other therapeutics.

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History is a Moebius Loop: Geopolitics of Yesterday and Today

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This essay will explain the title I chose to give it. The global strategic alignments taking shape at present manifest geopolitical concepts that evolved in the 19th century and influenced the game of alliances and rivalries throughout the last six score years. We are all aware that geography is a permanent feature of the planetary reality which casts history in its mold. Sometimes time folds like a sheet of paper in the shape described by Moebius to bring us back to the period when Britain, ‘ruling the waves’, feared the challenge of the Russian Empire, the hegemon of Eastern Europe and Eurasia, whose borders rapidly drifted towards India. Some new actors, the United States and China have joined the fray and become its central figures but the older ones have not fundamentally changed sides or ambitions.

The Rise and Applications of Geopolitics

In 1904 the British geographer and member of the Privy Council, Halford Mackinder¹ ‘officialised’ the dialectical opposition between continental Asia and its centre the ‘heartland’, and its oceanic girdle dominated by the United Kingdom, all the way from Glasgow to Hong Kong, along a string of bases and friendly harbours which included Lisbon (thanks to Portugal’s alliance with the Court of St James), Gibraltar, Malta, Cyprus, Port Said

at the mouth of the Suez Canal, Aden, Karachi, Mumbai, Colombo, Penang and Singapore.

Around Africa the Empire had thrown a necklace of ports of call and possessions such as Madeira, the Gold Coast (Ghana), Sierra Leone, Nigeria, the Cape Colony, Kenya and Somaliland. Access to the East Indies and China was thus well protected from potential enemies and rivals whereas London’s diplomatic ties with Paris and The Hague ensured that no threat to British ships would come from the French and Dutch possessions in Africa and South East Asia.

Mackinder articulated his fear about the threat posed to this long but fragile sea lane, the umbilical cord that connected the British isles to their worldwide domain by an expanding Russian empire whose fleets by then had won access to the Mediterranean through the Black Sea and which controlled Northern Iran as part of a longstanding design to reach the ‘warm waters’ of the Indian Ocean. To the East, the Tzars had opened a ‘window’ to the Pacific at Vladivostok and Port Arthur. According to Mackinder, the Russians were well on their way to establishing their hegemony over all of Asia as they owned its heartland and had extended their dominance over Mongolia and Northern China, taking advantage of the continuing decline of the Middle Kingdom.

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Around that time, Westminster took coordinating actions to forestall these perceived threats. A series of agreements with Russia in 1885 to 1907 put an end to the decades-old 'Great Game' in which the Tzars had sought to subjugate neutral Afghanistan and reach the frontiers of India. By forming the Triple Entente, London, Paris and Saint Petersburg made a common front against Germany and her allies. By striking a treaty with Japan, England helped the Mikado's armies to stop at Port Arthur the Russian surge towards the China Sea in 1905. The South of Iran and the Arab Gulf principalities were already under British 'protection' in order to close off the Arabian Sea to rival powers. At that point, the sole challenger left to the 'Empire on which the Sun never set' was the land-hungry German Reich with its confederates Austria-Hungary, Italy and the declining Ottoman empire.

A few years later the First World War, initially seen in Westminster as an opportunity to clip the wings of the rising German eagle, brought about a planetary political seism. The Russian Empire disintegrated in the wake of the October Revolution but was rebuilt in the form of the USSR which took over the geopolitical legacy of the Tzars, including their ambitions in Iran (where Northern Azerbaijan long under Russian control was made into a Soviet Republic) and the Far East where chaos had overtaken China after the fall of the Qing dynasty in 1911.

However, when Hitler rebuilt German power in the thirties (with massive American economic and industrial support), Britain and France saw the USSR as a necessary ally against the new Reich and willy nilly agreed after the second world war

to let the world be divided into zones of influence respectively dominated by the United States and the Soviet Union which had come to an understanding to defeat Nazi Germany, together with the British Empire. Once more the 'rimland' empire of England and its former American colony allied with the heartland in order to beat a third power which challenged them both. However, as soon as the Third Reich ceased to exist the 'natural' antagonism between Russia and the Anglo-Saxon thalassocracies was revived.

Civilizational and Ideological Foundations

No political and strategic project can be sustained sans the support of an ideological construct which can be racial, national or supra-national. The two contending visions now broadly defined as Atlanticism and Eurasianism with their multiple corollaries are no exception to this psycho-sociological principle. Great Britain justified empire building by arguing that her monarchy tempered by liberal parliamentary democracy was superior to all other systems and enabled her to become the most industrialized and the biggest trading state from the early 19th century. At the theological level, the British head of state claimed the succession of the monarchs of Israel, tangibly symbolised by the 'Stone of Scone' (*An Lia Fail*) said to be Jacob's Pillow and the throne of the kings of Judea. As such the British ruler was the 'defender of the (Christian) faith and his nation was the 'New Israel' (Brit-Ish was said to be derived from *Ish-Brit*: in Hebrew, the 'men of the Alliance' forged between God and his Chosen people).² Over the centuries this semi-theological racial notion came

to be extended to the 'English Speaking Peoples'³ and was celebrated by Rudyard Kipling, Cecil Rhodes and many other promoters and bards of the Empire.

Mackinder and other western geopoliticians such as Alfred Thayer Mahan and Nicholas Spykman belonged to that school of thought. They sought to preserve the thalassocracy rimland-based hegemony of the Anglos from the threats posed by rival cousins (the Germans) and steppes 'barbarians' (Russians and East Asians).

The USA, inheritor of the Anglo-Saxon and Celtic heritage was to see its relative ethnic homogeneity dissolve as growing waves of immigrants washed ashore from the old continent. British individualistic but hierarchical Liberalism harking back to the *Magna Carta* had been radicalised into the egalitarian precept of 'liberty' although it was understood by many of the founding fathers that the future Federal Republic had to impose some limits on democracy. Less than a century later Abraham Lincoln saw it as his duty to breach the principle of 'free and voluntary union' when he proclaimed that the US federation had some sort of divine character and that secession, though constitutionally lawful would be prevented even at the cost of civil war⁴.

In the wake of the mass new arrivals in following decades, the concept of 'melting pot'⁵ was devised to facilitate a merger of diverse incoming ethnic groups into the 'English' matrix even though racial stratification endured and created a hierarchy which kept the descendants of old British-Dutch settlers above the German, Jewish, Irish, Latin and Hispanic-Americans whereas Native populations and Blacks remained

at the bottom. In the sixties, the limited and largely utopian ideal of 'melting pot' was replaced by the more realistic description of the United States as a 'salad bowl'. Yet the power of American popular culture, promoted by an effective propaganda machine driving rampant consumerism enabled the Anglo-Saxon foundational ingredient to absorb and dilute most other socio-linguistic components while the Jewish factor, long suspected and disdained became dominant in most spheres of the new social and cultural architecture.

In all former lands and dependencies of the British Empire, English has entrenched itself as the elite medium of communication and shown its resilience and ability to displace and sometimes snuff out native tongues as shown by the fact, one among millions of such instance, that a French author has penned this article for an Indian publication in the language of the former colonizers.

In a way, the original colonial construct combining the English language, Constitutionalism, the Judeo-Protestant Bible and the commercial and financial vocation ('The business of America is business') is still the glue that binds the USA together and Samuel Huntington was perhaps the most influential voice to call for its revival.⁶ Whereas the British Crown upheld the supremacy of the imperial race of Saxons, Normans and Scandinavians and encompassed the diversity of the subjected peoples in the 'ornamental' trappings of traditional theocratic power. The American Republic adopted 'E Pluribus Unum' (Out of many the One) to meld the settlers, refugees and exiles that swole its population into one Anglophone, howbeit hybrid community.

The vision that Washington and Hamilton had of the thirteen colonies' future as a new republican Britain prevailed over the more cosmopolitan and 'classical' preferences of Jefferson (who wished ancient greek to become the national language) and also over the 'nativist' instincts of Benjamin Franklin.

The opposing ideology to Atlanticism has long been defined as 'Eurasianism'. Its infancy can be found in the first imperial Russian state when it absorbed a number of Slavic, Siberian and Turkic elements, pushed back the Teutonic Knights and defeated the Mongol Golden Horde. It hence acquired a unique identity on the fringe of Europe and yet distinct from it. The cement of the syncretistic state which proclaimed itself 'autocratic' (to affirm its sovereignty and independence from the former Turco-Mongol overlords) was the Orthodox Eastern Christian faith. The Tzars saw themselves as heirs to the Byzantine Roman Emperors and protectors of medieval Greek Civilization. Moscow was the second Constantinople and as such the Third Rome. In that capacity, the Russian State challenged the Holy Roman (German) Empire and claimed a leading role in European affairs as well as in West Asia but the decentralised hierarchy of Eastern Christianity led the Russian state to acknowledge the autocephalous legitimacy of the Greek, Georgian, Armenian, Bulgarian, Serbian, Syrian, Assyrian and other patriarchates. It also extended tolerance to religious minorities as an effect of its ethnic pluralism while it drew ideas and practices from the Netherlands, Germany, Italy, England, Sweden and Persia. In the 18th century, the Russian elites welcomed French Enlightenment before a

religious-nationalist backlash led to its official condemnation following the failed Decembrist coup. In the 19th century, Danilevsky enunciated a comprehensive pan-Slavist Eurasian thesis⁷ which had a far-reaching influence on his contemporaries and on some notable Soviet intellectuals.

It was however after the fall of the Romanov Empire that the Eurasian doctrine was fully defined by Anna Akhmatova's son Lev Gumilev who essentially summed up elements of a continentally autochthonous and syncretistic Russian civilizational theory⁸ occasionally alluded to by Pushkin, Gogol, Tyuchev, Tolstoy and other great writers and artists while expurgating it from the Christian religious legacy. While Soviet Communism brought a radical break with the Christian, spiritual and monarchical traditions it also harked back to some atavistic memories of slav collectivism and orthodox anti-liberalism. In the early years of Bolshevik rule, some of its elite dreamed of a fusion between the ideal of the 'Communist Man' and the Buddhist concept of the Bodhisattwa as known in Mongolia and Tibet, viewed by those Eurasianists as an enlightened superman⁹. Arnold Toynbee has a point when he argues that the conversion of the Russian Empire into the USSR protected the Eurasian landmass from being sucked into the liberal western orbit¹⁰.

After the dissolution of the Soviet Union and the correlative economic and political eclipse of Russia, a 'neo-Eurasianist' doctrine has evolved in Russia under the leadership of nationalist intellectuals and economists such as Alexander Prokhanov, Alexander Dugin and Sergey Glaziev in the Izborsk Club and has become at least one

of the sources of inspiration of the Federal State. Under the joint impulsion of the Russian Federation and of the ex-Soviet republics of Kazakhstan and Belarus, the Eurasian Economic Union has taken shape and has expanded to other Central Asian and Caucasian states. It is an economic counterpart to the Collective Security Treaty Organization which provides military coordination between most of those countries for the common defence. Thus a structure to protect the 'Heartland' is newly in place.

The Role of China, Iran, and India

Mackinder regarded the Far East, including the Chinese Qing Empire as a part of the periphery, perhaps because being a white supremacist like most westerners of his time he did not foresee the 'yellow' nations playing a powerful role on a level of equality with the then-ruling Europeans and North Americans. In the prior two centuries, the Middle Kingdom had lost much of its western and northern tributary lands to expanding Russia and it exercised only nominal suzerainty over Tibet. Indeed since more than two millennia, China had been regularly invaded by western nomadic conquerors which the famed Great Wall was erected to keep out. However other observers had predicted that if the Celestial Empire ever regained its clout it would again seek to expand into its erstwhile dependencies both in Indochina and towards the west.

The Maoist takeover of Eastern Turkestan renamed Xinjiang (the new territory) in 1949 and the reassertion of control over Tibet in the following year (Tibet had unilaterally declared its independence in 1912) fulfilled those age-old claims and paved the way for the pursuit of further

ambitions. Since 2013 at least the Chinese doctrine for economic expansion has been articulated around the well known historical narrative of the transcontinental and maritime silk roads whereby Beijing has affirmed its manifest destiny as a Eurasian and oceanic power. In a way, China picked up the Russian *Razvitie* project¹¹ for the comprehensive development of Eurasia and Siberia along both east-west (from the Netherlands to Korea) and north-south (from Norway to Iran) axes, hitherto hampered by the Kremlin's economic difficulties and the US imposed sanctions. China also joined Russia's plan to develop the Arctic sea route as a shortcut from the Far East to Europe and gave a new lease of life to the prospects for transcontinental cooperative development.

So far in Central Asia, Siberia and the Arctic ocean the PRC's success hinges on Russia's cooperation whereas in the China Sea and the Indian Ocean the Chinese merchant fleet and navy must deal with a powerful American military presence seconded by a chain of regional allies, stretching from Japan in the north to Australia in the south and potentially India to the west.

So China and Russia are for now tied by common interests in the Eurasian continent and by a mutual need for protection from the hostile Anglo-centric powers. Their competing claims in the heartland are however not easy to reconcile in the long term and their respective attitudes to India and Vietnam, for example, evince their divergences. Beijing takes an unyielding revisionist position vis-a-vis these two countries and aggressively lays claim to some bordering territories they hold (for India certain areas of the Himalayas and the Spratly and Paracel islands

for Vietnam). Russia, on the other hand, maintains close relations with New Delhi and Hanoi and does not support China's claims which create misgiving among all her neighbours and impede Asian economic and strategic integration.

India so far has remained on the fence of the Eurasian convergence project as it fears the prospect of the PRC's hegemony for which the Shanghai Cooperation organization paves the way. The latest border clashes between the Chinese and Indian armies in Ladakh in June 2020 have elbowed New Delhi further towards the US-sponsored Indo-Pacific Quad quasi-alliance.

Another traditional pivot power is Iran which was bitterly disputed between the British in the south and the Russians in the north for much of the 19th and early 20th centuries. Since the Islamic Revolution Tehran has formed strong economic and strategic relations with the Kremlin while developing extensive economic links with China and retaining its traditional cultural and trading bonds with India. The prolonged American attempts to force Iran back into the 'rimland' league have failed and the military occupation of Iraq and Afghanistan on both sides of the country has resulted in costly failures for the US armed forces.

An alternative to aligning with the Heartland Sino-Russian compact or with the Anglo-Saxon-led rimland coalition has been proposed by India in the form of a 'neutral' Indian Ocean Rim Association (IORA) but in binary world order (which reflects the anthropological mindset) third options are generally neglected and its very name seems to condemn IORA as all of its member-states to fall prey to Sino-American rivalry

which is at play in that wide area. The rising pressure applied by the USA on Iran has deeply damaged Indo-Iranian economic and diplomatic linkages which is a further sign of the ongoing regional realignment. While China becomes the Islamic Republic's main partner New Delhi moves closer to Saudi Arabia, the United Arab Emirates and Kuwait.

We have also briefly evoked another important rimland state, Turkey which has in the past repeatedly switched sides between the European continental and maritime powers (Britain, France, Germany) but has a dominant central Asian ethnolinguistic identity and is a traditional foe of Russia due in part to the contested Byzantine legacy.

However, geography and its logistical implications tie Turkey to its greater region around the Black Sea and the Mediterranean more than to the distant Atlantic powers. In Syria and towards Iran, Erdogan's government has had to acknowledge the need to take into account the major neighbours to the north and east despite his personal contrary impulses.

From The Cold War to the New Great Game

We need not cover in detail the history of the years from 1945 to 1990 when the USSR disintegrated, putting an end to the bipolar world order that emerged after the war. Following half a century of nearly frozen conflict between the Anglo-American Atlantic Compact and the Soviet led-East, the abrupt decline of Russia left the USA in a globally hegemonic position but it coincided with the emergence of China as a factory to the

world which ten years later joined the WTO and rapidly rose to economic prominence. From 1971, at the very same time that it gutted the Bretton Woods monetary system by abandoning the gold standard for the US currency, the Nixon presidency struck a near-alliance with China which effectively implied that the People's Republic rejoined the 'rimland' league against the Soviet-dominated heartland.

In the nineties Beijing, thanks to China's fast-growing power came into a position to bring the heart of Eurasia, formerly a part of the defunct USSR, under its influence and this project, as we have said earlier has been officialised as the Belt and Road initiative (BRI).

From the year 2000, China's economic and strategic rise was accompanied by the revival of Russia's geostrategic dynamism. The two continental-size countries were brought together by common interests, in order to protect themselves from an overbearing 'sole superpower'. The 2007-08 financial crisis and resulting recession durably weakened the western NATO bloc and accelerated the decay within the US political and economic system, exposed by the so-called 'sub-prime' debacle. From 2010 Chinese leaders felt that global predominance was within reach for the People's Republic while Moscow could hope to rebuild its old commonwealth of the 'near abroad' from the borders of Poland and Romania to the boundaries of Korea and Iran. The complementarity between Chinese and Russian economies helped the Kremlin and the Forbidden City to paper over their old misgivings and differences for the sake of mutual benefit.

The vision of an economically consolidated

Asia expanded to its western European peninsula as well as to its oriental outer belt (the Koreans, Japan, the ASEAN nations) and to its southern flank (India, Iran and the Arab crescent) began to take shape in the plans of both Moscow and Beijing.

A riposte from the United States and its close allies and tributaries was expected as the 'incumbent' superpower system could not let itself be dismantled politically and economically by the rival 'Eurasian' alliance. The attack on China, Russia and Iran, the three 'poles' of that triangle from Washington rose in intensity in the second decade of our century even as the entanglement between China and the USA grew in scope and complexity. Multiple complaints of cyberattacks were raised against Beijing and Moscow by American state agencies and corporations. The Russian Government for its part was accused of committing gross human rights violations and of assassinating certain Russian dissidents or exiles in the West and at home on the basis of unproven claims made by American and British Intelligence sources, resting on weak premises and often outlandish logic¹². As we know Iran was continuously under fire for its alleged nuclear ambitions and opposition to the positions and plans of the US and the latter's regional allies Israel and the Arab monarchies¹³. The leading western powers have also openly intervened in border areas such as Georgia, Ukraine and Hong Kong in the name of supporting democracy and human rights. Whatever we think of the internal issues in those jurisdictions we cannot be blind to the fact that there is a coordinated strategy from the 'Five Eyes', the Anglo-Saxon alliance of the US and leading British Commonwealth states to weaken the real targets

(Russia and China) in order to prevent them from going ahead with their long-term continental projects.

On the larger canvas of Europe, the US and Britain have also undertaken a series of actions to prevent Europe from moving towards autonomous unity and from linking up with Russia and China economically and technologically. BREXIT, an intense campaign of attrition against German finance and industry (especially intended to prevent the completion of the Nordstream II project) and a constant propaganda barrage against Russia's government and society are part of that multi-pronged project aimed at defeating the Eurasian consolidation scheme even at the cost of depleting further the already suffering western economy. In a way, the imperial American plan stole a page from Israel's 'Samson Option' (risking self-destruction in order to annihilate the enemy) and put it into its global operational manual.

Who will win?

Moves and counter-moves are taking place across the global chessboard as we write. The Russian and Chinese agreements with Venezuela help the potentially richest country in Latin America to remain a bridgehead to the US backyard. While Russia has solidified its positions in Syria and Libya, China and Iran are preparing an ambitious 25 year economic and strategic partnership agreement¹⁴. Iran, China, and Russia are all active in Iraq. Beijing and Moscow both have developed various common interests with Turkey despite President Erdogan's unpredictable double game between east and west. India and China are at loggerheads over long-standing border disputes but are also deeply involved with each other in matters of trade and

investment although the economically asymmetrical relationship, howbeit mutually beneficial threatens to degenerate into all-out reciprocal hostility if it is not managed better and if India is pushed by China's overbearing behaviour into a US-dominated Pacific alliance.

Geographically South Asia, Indochina and the Malayo-Indonesian islands are part of Mackinder's oceanic 'outer belt', together with Australia and the Washington-London axis hoped that independent India could at some point be added to what was formerly the SEATO alliance under whose shadow ASEAN was created. Likewise in the Gulf and West Asia which Spykman described as the southern rim, western powers are militarily and economically entrenched, mainly in Saudi Arabia and the other Arab kingdoms and expect Iran, under the pressure of sanctions and threats of war, to shed at some point its anti-American, anti-Israeli stance and become once again an ally as it was until the 1979 Islamic revolution.

We have already seen that Europe and Africa are also contested territories where both the opposing blocs have major assets and interests. As a result, the principal continental nations of Europe as well as most African states tend to hedge their bets while balancing the influences of the respective powers as India itself is doing. A fading NATO, given a step-motherly treatment by the Trump administration is no longer holding the western bloc together. The French President Emmanuel Macron has said that it is 'brain-dead' and other nations keep their options open as they can no longer depend on American backing. Germany, traditionally the main NATO pillar, well aware that it is targeted by Washington for

‘downsizing’ refuses to raise its military budget to the 2% of GNP required by the White House and shows greater interest in the development of an ‘All European Army’. On the other hand, Poland and other Eastern states continue to rely on their alliance with the United States to keep Russian and German pressure under control. However few now fear that a military clash between the ‘heartland’ and ‘rimland’ power will take place on the European theatre, simply because the US is too far and cannot hope to win such a conflict without the full support and participation of its NATO members which is in doubt. The Western Pacific and the South Asian belt, somewhere between Iran and the South China Sea contain more flashpoints between inimical nations and are of greater interest to both the USA and its principal adversaries.

The key question which should take priority for American decision-makers is whether Russia and China can continue to remain on the same side in this planetary contest or whether China which Nixon and Kissinger saw as part of the ‘rimland’ as Mackinder and Spykman had, will eventually lose its Russian partner due to the Kremlin’s fear of becoming Beijing’s satellite. Donald Trump clearly seeks to bring Russia into the ‘Atlantic’ Camp in order to isolate China, reversing Kissinger’s anti-Soviet strategy which led the US to build up the PRC as a global industrial power. However the policy-making community in the US seems consumed by an aversion to Putinist Russia which makes such a rapprochement unlikely at best.

The globalist thinking dominant in the ruling circles is that China is a major economic engine of

world economic integration whereas Russia is seen as a dogged opponent of this neo-liberal (and neo-conservative) project.

The British and the Americans in the first half of the 20th century wanted China to be a subsidiary ally of their ‘common’ empire and they would still like to find a way to tame the Chinese Communist Party as they have hoped since 1971. However, as the reality of western decline in the face of the PRC’s meteoric economic rise sinks in the urge to slay the Dragon is taking over the Anglo-American establishment and that new priority can only bring Beijing closer to Moscow. Mackinder and his disciples would have warned of the danger for the western alliance to lose both the heartland and the main power in the far-eastern rimland (China) which cannot be defeated without a major internal upheaval that might bring down the government. Likewise, Putin’s national policy doctrine is now institutionalized in Russia by the recent constitutional reform and it will be much harder for foreign forces to turn the country around as long as the majority of the people and the elites find their common interest in staying the generally ‘protective’ sovereign course.

The west is on a losing track as long as it is wedded to a form of capitalism less and less viable in the face of a worsening financial and structural crisis which pushes the US Government and others to adopt arbitrarily protectionistic measures, slap sanctions on ‘inconvenient’ nations and threaten or use extortion and naked force whenever possible.

Immanuel Wallerstein predicted that Russia and Europe were fated to come together by geography, history, culture, strategic convergence and economic complementarity¹⁵. On the other

hand, he saw China and the USA finding a *modus vivendi* as the two industrial and financial superpowers facing each other on opposite shores of the Pacific which is surrounded by the most dynamic and fast-growing countries of this century. Events of the last few years belie his forecast as the PRC and the USA engage in an increasingly bitter contest while an ideological iron curtain - or rather a NATO fence - still keeps the EU and the Russian Federation apart. India's options are narrowing¹⁶ and New Delhi's ability to remain a 'hinge' power is in doubt as many of its experts and decision-makers are calling for alignment with the Anglo-Saxon led Indo-Pacific league. Yet India's strategic ambivalence is a

source of strength as it keeps opportunities open on all sides and protects the country from the risk of being dragged into a war for issues that are not of direct national concern. For one, India has little to lose in the South China Sea dispute, whatever its outcome which would damage only the contending coastal states.

At the dawn of the last century, the major European countries had joined opposing alliances in the belief that they would keep the peace and protect them from attacks. In fact, the system forced the escalation of a tragic incident in June 1914 into a continental five-year fratricidal massacre. Today Asia should beware of falling a victim to the new version of the Great Game.

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Regulation of Temples: An Aberration in a Secular State

Siddharth Acharya*

John Adams once said, "... a Constitution of Government once changed from Freedom, can never be restored. Liberty, once lost, is lost forever".¹ It is true that the Government is the entity that regulates the functioning and relationships between one country and another, between a state and its subjects, between a state and another state and between one individual and another. In the pursuit of exercising this power, at times the Government exceeds its governance over the very constitutional rights and liberties which are enshrined in the Constitution for the purpose of safeguarding the rights of its subjects in the interest of justice and equality. In the particular instance of violating such a Constitutional right, when the power of control and governance overshadows the rights and liberties of the subjects of the Constitution, it is important that an intervention is made by the Judiciary which is entrusted with the duty of protection and preservation of the rights and liberties of the people.

Article 25 of the Indian Constitution not only confers a fundamental right on every person to freely propagate any religious belief but it also provides freedom to profess all the activities prescribed and sanctioned by that religion subject to certain restrictions. There is a wide safeguard provided and guaranteed by the Constitution whereby the word "to practice" the religion has

been stated in Article 25. In order to ensure that the properties belonging to the various religious denominations are administered along with all essential rites and rituals prescribed by the said religion with complete autonomy, subject to certain restrictions, Article 26 has played a pivotal role in this regard. Article 26 (d) of the Constitution terms it to be a violation of a right if any law takes away the constitutionally granted right of such administration from the ambit of the religious denomination.

Every institution has the right guaranteed under Article 25 of the Constitution to practice and propagate freely, the religion of which the individual and her/his followers adhere to. Article 26 of the Constitution of India provides a religious denomination the right to establish and maintain institutions for religious and charitable purposes, to manage its own affairs in matters of religion, to own and acquire movable and immovable property and to administer such property in accordance with law. Subject to public order, morality and health, every religious denomination or any section thereof has the right to administer its property *according to law*. Hence, the administration of its property by a religious denomination has been placed on a different platform from the right to manage its own affairs in matters of religion. The latter is a fundamental right which no legislature can take

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away, whereas the former can be regulated by laws which the legislature can validly impose.

The language of the two clauses (b) and (d) of Article 26 bring out the difference between the two at the first instance. Regarding affairs in matters of religion, the right of management given to a religious body is a guaranteed fundamental right which no legislation can take away. However, regarding administration and functioning of a property which a religious denomination is entitled to own and acquire, it is certain from the intention of the Constitution of India that the right to administer such property is undoubtedly with the administrative body of the religious denomination, provided it is in furtherance of law. This would mean that the state can regulate the administration of a trust property by means of validly enacted laws; but here again it should be remembered that under Article 26 (d), it is the religious denomination itself which has been given the right to administer its property in accordance with the law. In the case of *Commissioner Religious Endowments v. Lakshmindra Swaminar*, it was stated that any law, which overpowers or takes away any right of administration as a whole from any religious denomination and vests it in any other secular authority, it would stand strictly in violation of the right guaranteed by Article 26 (d) of the Constitution.²

The Supreme Court has held as follows:-

“As regards Art. 26, the first question is, what is the precise meaning or connotation of the expression ‘religious denomination’ and whether a Math could come within this expression”. The word ‘denomination’ has been defined in the Oxford Dictionary to mean ‘a collection of individuals classed

together under the same name; a religious sect or body having a common faith and organisation and designated by a distinctive name’.”³

Hence, to invoke Article 26 of the Constitution, ‘Sevaks’ who are the people/staff working for the deity at a religious premise have to prove two facts that:-

- 1) They established the temple,
- 2) They have maintained the temple.

The Supreme Court has laid down the distinction between right of ‘religious denomination’ to manage its affairs in matters of religion and to acquire movable and immovable property and to administer such property in accordance with law in the celebrated judgment in *the Sri Shirur Mutt*⁴ case. In Para (17) of the judgment, the Supreme Court has held as follows:-

“It will be seen that besides the right to manage its own affairs in matters of religion, which is given by clause (b), the next two clauses of article 26 guarantee to a religious denomination the right to acquire and own property and to administer such property in accordance with law. The administration of its property by a religious denomination has thus been placed on a different footing from the right to manage its own affairs in matters of religion. The latter is a fundamental right that no legislature can take away, whereas the former can be regulated by laws that the legislature can validly impose. It is clear, therefore, that questions merely relating to administration of properties belonging to a religious group or institution are not matters of religion to which clause (b) of the Article applies. What then are matters of religion? The word ‘religion’ has not

been defined in the Constitution and it is a term which is hardly susceptible of any rigid definition. In an American case⁵, it has been said "that the term 'religion' has reference to one's views of his relation to his Creator and to the obligations they impose of reverence for His Being and character and of obedience to His will. The above explanations and definitions stand strong to advocate the fact that the Articles 25 and 26 of our Constitution are based for the most part upon the Article 44 (2) of the Constitution of Eire and it is highly unlikely that the definition of 'religion' as stated above could have been in the minds of our Constitution-makers when they framed the Constitution. Religion is purely a matter of belief and dedication in one's faith amongst individuals and the communities at large and not necessarily theistic. There are well-known religions in India like Buddhism and Jainism which do not believe in God or for that case in any Intelligent First Cause. A religion undoubtedly has its basis in a system of beliefs or doctrines that are regarded by those who profess that religion is conducive to their spiritual well-being, but it would be incorrect to say that religion is nothing but a doctrine or belief. A religion may not only prescribe directives and rules for its followers to accept and abide, it might also prescribe rituals and observances, ceremonies and modes of worship which are regarded as integral parts of religion."

In a landmark case of *Dr. Subramanian Swamy v. State of Tamil Nadu & Ors*⁶, the Apex court expressed its firm support towards the administration of a property by a religious

denomination stating that the control and management of a religious property must remain with the ones bestowed with the authority and responsibility to maintain and administer. The Government can have the general right to regulate and act in providing its support to the above-mentioned cause in the field of preserving law and order, health and sanitation, and various other welfare standards. However, it cannot seek indefinite control over the administration of any religious denomination.

It is pertinent to mention that in the famous judgment of *Ratilal*,⁷ The approach taken by the hon'ble Supreme Court was liberal, whereby it was not only faith, beliefs and ethical codes of conduct that were playing an integral part in professing a religion but also the rituals, ceremonies, and practices that played an essential role in the following and belonging to a certain religion.

In a matter dealt by a single bench of Calcutta High Court, Justice Bhagabati Prasad Banerjee wrote:

*"...The concept of Tandava dance⁸ was not a new thing which is beyond the scope of the religion. The performance of Tandava dance cannot be said to be a thing which is beyond the scope of religion. Hindu texts and literatures provide [for] such dance. If the court started enquiring and deciding the rationality of a particular religious practice then there might be confusion and the religious practice would become what the courts wish the practice to be."*⁹

The above text makes it clear that the judicial system of our country is of the opinion that subject to certain mandatory restrictions, the control over

administration and professing any religion should be bestowed on the religious denomination, not the government. Furthermore, Article 27 of the Constitution of India provides that no person shall be compelled to pay taxes, the proceeds of which are specifically appropriated in payment of expenses for the promotion or maintenance of any particular religion or any religious denomination.

Articles 28, 29 and 30 of the Indian Constitution are in consonance with the abovementioned provisions of the Constitution. The Hon'ble Supreme Court in *Aruna Roy v. Union Of India*¹⁰ held that there is no prohibition in imparting religious instructions, which clearly signifies that once religious knowledge is attained, the subjects to that religious belief may profess and practice the same. In a very popular case, also known as the *National Anthem Case*¹¹, the Division Bench stated that a person may not sing the National Anthem if he has genuine conscientious religious objections. This depicts the seriousness allocated to the importance of freedom of religion promoted by the Indian judiciary. Article 29 and 30 hold the hands of the minorities and provide them with the strength and safeguards in the spheres of protection of their rights to establish and administer educational institutions which enable them, irrespective of their religious beliefs and language, to learn and profess any preaching or religious belief they desire. Judiciary has time and again played a pivotal role in protecting the freedom of religion and the religious denominations from falling in the hands of the government.

In the significant case of *Sidhrajibhai Sabbai*¹², the minority Christian society which was running several primary schools along with a

Teacher Training College in Gujarat was involved in a litigation with the State of Gujarat. The State heavily tried to interfere with the admission policy of the college and the matter was taken up in the Hon'ble Supreme Court, where the Court found that there was a severe contravention by the State in the rights of the college against Article 30(1). The Apex Court stated that the state may intervene in the aspects of health, sanitation, discipline and public order in improving the facilities provided to the college but none of it can prejudice the right conferred upon the college under Article 30 of the Constitution. The Court went further ahead in stating that the regulatory measures of the state could only be in the interest of the minority institution.

Articles 14, 15, and 16 of India's Constitution providing religious freedom and right to equality are the backbone of all the above-submitted contentions. It is not essential to understand that the reading of the above Articles provides an overview of the framers' intention. The same was evident from the reading of the text that freedom to practice and have faith in any religion is provided equally to the subjects of the Constitution. It is this freedom and equality provided to them under the Constitution that enables them to profess and administer the properties belonging to their religion in their own manner, subject to certain restrictions provided by our laws. But nowhere it can be inferred that the Government should be free to interfere and take absolute control over any religious denomination under the garb of regularising the administration and affairs of the premises of the religious denominations.

In the recent *Sabrimala Temple*¹³ case, where

the judicial intervention was requested, there were few contradictory opinions provided by the Hon'ble Judges. One of the opinions was that the exclusion of women from the temple effectively rendered their right under Article 25 meaningless and Article 25(1) protects the fundamental right of women between the ages of 10-50 years to enter the Sabarimala Temple and enables them to exercise their freedom of worship. Furthermore, it was stated that there was sufficient material to conclude that the exclusion of women from Sabarimala violated Article 25(1) and the Ayyappans' custom of excluding women, who were between the ages of 10-50 years, from the Sabarimala Temple was unconstitutional. On the other hand, the other opinion was that the devotees of Ayyappa did not pass the constitutional test to be declared as a separate religious identity and the Ayyappas were Hindus. Hence it was stated that the temple's denominational right to manage its own internal affairs, under Article 26(b), was subject to the State's social reform mandate under Article 25(2)(b) which provides that the State can make laws to reform Hindu denominations. It was further stated that Article 25(2)(b) allows the State to make any law that opens a public Hindu institution to all 'classes and sections' of Hindus. The term 'classes and sections' were interpreted in a manner as to include the gendered category of women, thereby concluding that the Sabarimala custom of excluding women is subject to State mandated reform.

Contradicting the above-mentioned opinion, it was further stated that the constitutional morality in a secular polity, such as India, requires a 'harmonisation' of various competing claims to

fundamental rights and the Court must respect a religious denomination's right to manage their internal affairs, regardless of whether their practices are rational or logical. The instant case of Sabarimala Temple satisfies the requirements for being considered a separate religious denomination and therefore the Sabarimala Temple is protected under Article 26(b), which provides it a right to manage its internal affairs and is not subject to the social reform mandate under Article 25(2)(b), which applies only to Hindu denominations. Further stating that in Article 26, denominational freedom of religion, is subject to 'public order, morality and health' and 'morality' (constitutional morality) must be understood in the context of India being a pluralistic society; therefore, the State must respect the freedom of various individuals and sects to practice their faith.¹⁴

We are not alien to the fact that since the British era, the desire to control the Hindu temples has been in the hearts and minds of the governments as the temples have stood strong as a source of revenue. In 2017, Dr. Satyapal Singh introduced a bill in the Lok Sabha to free administration of the temples from the government's clutches. The bill emphasised on the state having no religion and being a secular entity. There has always been a widespread grievance that Hindu temples and religious charitable institutions are routinely taken under the clutches of the secular state in the name of maladministration, mismanagement and misappropriation of funds etc. whereas, on the other hand mosques and churches belonging to the minorities are exclusively administered and regulated by their respective communities exercising their right under Article 26. MP

Dr. Satyapal's bill in an emphasizing manner stated that the states under Article 25 shall not control any institution or property established maintained and administered for any religious purpose as the acts performed by the government under veil of controlling the temples are unconstitutional and discriminatory.

The landmark judgment of *Sri Marthanda Varma (D) Thr LRs & Anr. v. State of Kerala & Ors.*, also known as the Padmanabhaswamy Temple Case,¹⁵ proved to be a consensus between religion and politics in the society wherein the rights of the royal family of Travancore were upheld in respect to the administration of Padmanabhaswamy Temple situated in Kerala which is also considered to be the richest temples in the country. By doing so the Supreme Court had set aside the verdict of the Kerala High Court wherein the Kerala Court had directed the State Government, that in order to take control of the temple, a trust be created. The hon'ble Supreme Court upheld the "Shebaitship" of the family of Travancore originally responsible for taking care of the temple and conferred upon them all the rights towards the administration of the property as the trustee, thereby bestowing upon them the rights over the property as a manager responsible for management, preservation, administration of the property and also the right to defend the property against all odds which is provided under the statute also. It can be clearly inferred from the above decision that the judiciary too stands for the rights and freedom of a person with respect to his religion as conferred upon him by the Constitution of India.

Since independence, the administration of the temples has been under the control of monarchs

who have always been very closely affiliated to the ceremonies and rituals carried on as traditions in the temples, and there were some questions which were raised whenever the state tried to interfere to gain control over any religious denomination. If the State has professed itself as 'Secular' body, how can it affiliate itself with the administration and well-being of Hindu Temples? And will it be just for the State to utilise the specific wealth from the Hindu Temples and use it for its own purposes? These are some important concerns that need to be addressed. One of the most common justifications given for the above questions would be that the Devaswom board/committee of elected persons by the Government would only control and administer the secular actions/functions of the temples and the rest of the religious functions would be left unhindered. But the truth has always been that the above mentioned functions were inseparable and hence their control could not be diluted.

Therefore, in conclusion it can be stated that the right conferred upon a person by the Constitution cannot be violated by any government or administrative authority subject to exceptions whether the right pertains to the right to life, right to freedom and dignity, right to belief and profess any religion and hence, also the right to practice and administer the various religious denominations pertaining to that religion. However, this conclusion will attain legal significance only after the hon'ble Supreme Court of India decides the best judicial direction and conclusion to this debate of bestowing the power of control and administration on the side which constitutionally deserves so, by adjudicating in the matter of Jagannath Puri Case.

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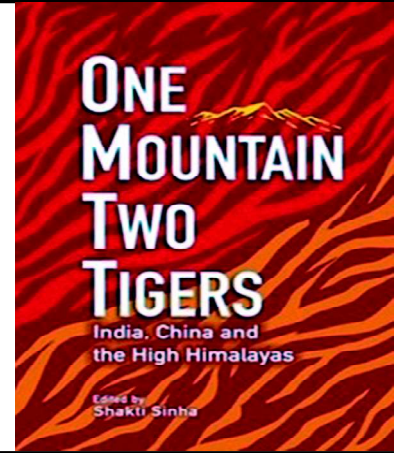
One Mountain Two Tigers: India, China, and the High Himalayas

Author: Edited by **Shakti Sinha**

Publisher: **Pentagon Press**

Pages: 201, *Price Rs.* 795/-

Book Review by: Aanchal Pannu*



This compendium edited by Shakti Sinha, released amidst the current political uproar in India-China relations, has come at an opportune time. The book consists of a series of essays mapping out India-China relations through the millennium and earlier. It considers the many myths that China has masked itself under, and works to unravel distinct questions about the history behind the country and its relations with India. In today's age, where information released in the media is more often than not taken with a grain of salt, this book provides a comprehensive history of India-China foreign affairs, separating fallacies from facts, establishing and analysing the origin of the relationship between the two ancient nations. The first essay shows the far-reaching cultural influence of Indian civilization across what is now mainland China.

The author adds particular emphasis onto the region of Uttarakuru (now Xinjiang) and how the Indians of the post-Vedic era had an impact on the region's language, culture and religion. The book takes on a rich narrative moving through the ages from the time where the parent languages Prakrit

and Sanskrit were still in use across the landmass. From there the book carries on to the early relations between Ladakh, Bhutan and Tibet; a point which the author correlates with the influence on Indo-Tibet relations during Nehru's time as Prime Minister. And later the book delves significantly on the occupation of Tibet and Xinjiang by the People's Republic of China, an issue that is under debate to this date. The essay focuses not just on the occupation of the country, but the effect it had on trade relations, cultural ties, and politics of Tibet for times to come. The book brings out the nuances of the history between India and China as well as the surrounding territories that were affected, influenced, or in some cases occupied by China. While most accounts on the topic go as far back as the colonial and postcolonial era to understand the conflicted and tug-of-war like relationship the two countries share, in this case, the book means to establish a firmer grasp on the millennia-old history that has culminated to the current standing and relations both countries hold.

Here, three of the 14 chapters of this book provide a brief of the history before and during

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that of the Colonial era and from the 4th essay, the book proceeds its journey in the relatively modern history of the countries. With a chapter on the history of the Indo-China border dispute and with the current flare-up on the Line of Actual Control (LAC), it provides the necessary context to understand why the border has been and continues to be under contestation since the McMahon line came into existence. In our recent memory of the tug-of-war like alliance that India and China seem to possess, the beginning of what appeared to be a growing animosity from China's side came to a head in talks leading up to the 1962 Indo-China War. Two of the essays that form this book cover the reasons that informed the rather violent dispute and shook India out of its pacifist stupor leaving a deep dent in the two countries' impressions of the other. The rest of the book brings us back into the 21st century to answer our questions about the current status-quo between PM Modi and President Xi Jinping.

The Galwan scuffle and how India chooses to react both in terms of our military response and well as our political response is taken into analysis. The book looks into China's choice of the battlefield in Ladakh, what India can do to strengthen its capabilities, and reviews the politics of the case. One chapter argues for an amendment to the Rules of Engagement due to the lack of regard for them by the opposition, which inevitably puts the Indian Forces at a potentially fatal disadvantage. Aside from a strategic perspective on the issue, the book

also addresses the political effects after delving into the Wuhan and Mamallapuram Summits in 2019, where both leaders attempted to keep the matters calm, yet both sides appeared to lack consensus in the case of the disputed boundary. The book then moves into the different external powers that play a role in this- the influence of Pakistan and the United States, Tibet, and Taiwan, taking into account China's current Belt and Road initiative. The book finally ends with an analysis of the Chinese Communist Party and speculations of what could have caused this outbreak of blatant military coercion towards India on the front of the LAC and the aggressive behaviour in the South China Sea affecting- Vietnam, Philippines and other south-east Asian countries. The speculation stands that it could be a dodge from the world-wide accusation and conspiracy around the Corona Virus being a deliberate human-made concoction on the part of China.

Overall, this book ties up the medley of the different interactions shared by India and China throughout history. Each of the events written about in this book has very clear consequences that effect both countries and their current perspectives of their position in the world order. The book connects these instances in an uninterrupted flow that makes understanding the context of these exchanges effortless. In light of the ongoing geopolitical tussles, it makes for an ideal read to gain an overall understanding of India and China's ancient and very convoluted relationship.



The Good Country Equation: How We Can Repair the World in One Generation

Author: Simon Anholt

Publisher: Berrett-Koehler Publishers, 2020

Pages: 240, *Price* Rs. 1836/-

Book Review by: Kuldeep Badlani*



Going by the words of French-Romanian playwright Eugene Ionesco, “It is not the answers that enlighten but the questions”, Simon Anholt’s book titled “The Good Country Equation: How We Can Repair the World in One Generation” is an apt response to a prominent question faced by the planet- “Why doesn’t the World work?”

Presented in the form of an autobiographical travelogue, the book weaves the personal and the political together in a series of anecdotal chapters. Through fascinating first-hand accounts with governments all over the world, Anholt, who has advised fifty- six countries on strengthening effective international engagement, has successfully laid out solutions for the complexities of mutual engagement between nation-states.

Anholt begins with the notion that the image of the nation determines its fate. Nevertheless, to further clarify, the Nation brand is not a product of effective propaganda. Propaganda, if worked upon generations, may work inward, but global propaganda is a myth. Therefore, uprooting the long-held beliefs and notions about nations by emphasising that planting new deliberate seeds of

perception has to be an organic process. Citing references from his travels across the globe, Anholt has adequately demonstrated successful results in implanting an improved image for nations internationally.

Providing a unique perspective on nation-states across the world, Anholt has brilliantly divided the world into three timelines based on interactions amongst nations: Combat, Competition and now Co-operation. With numerous tried and tested methods to improve the nation’s image in the world, Anholt’s method proves that the world’s behaviour needs to shift from competitive to co-operative, that all governments can cater inward self-interests while playing a useful role on a global level.

Although for most parts Anholt avoids placing much importance on the concepts and dynamics of Hard Power and Soft Power, he considers a *unique identity* to be of much importance for countries. He states “For smaller countries, identity is the indispensable means by which they will achieve growth. Countries that are not powerful need to be interesting”. However, is cultural heritage, something that citizens prize as much as they should? He states that the four basic appetites

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that a community needs for continuity are cultural appetite, intellectual appetite, spiritual appetite and animal appetite. But in today's age, how many countries are actually capable of catering to cultural appetites and spiritual appetites? Without satisfying these two "our tummies are full, but our souls keep rumbling" says the author.

It is difficult not to notice the informality in his approach while dealing with international relations. Nuanced description of his travel and wit loaded excerpts from his interactions with leaders of countries from around the world make the book an interesting and easy read.

The book convincingly makes the case that the interest of the self lies in the interest of the whole, which translates to the fact that governments must look beyond their inward interests, that it is not a question of 'if' but 'how much' is a nation contributing to the world.

Nevertheless, the author has acknowledged that in order to seek reigning continuity, it is not outrageous for any government to place inward interests superior to global contribution. Addressing the same, Anholt argues that humanity exhibits "mild but highly pervasive form of endemic cultural psychopathy" when the interests of other nations are concerned.

Breaking the established norm of monoculturalism, Anholt proposes multilateralism for a practical approach to improve its "Good Country Index". This project of Anholt does not imply *good* in the traditional sense of moral value judgement but a thorough rating system which reflects what a particular nation is serving to the globe. This contribution is not necessarily transacted in terms of Hard Power.

Anholt has challenged the notion that the

behaviour of a nation concerning another nation depends solely on bureaucrats, foreign ministers and uppermost government officials. For any nation to improve under the Good Country Index, a more effective contribution comes even from individualist sources, like mayors for instance as he says that "the future of international community lies in the hands of mayors and governors (more than) than monarchs and presidents."

The selection of anecdotes by Anholt from his experiences not only serve for a nuanced characterization of a place but also enable the readers to delve on the varied issues faced by nations. Through his book, Simon Anholt has attempted to simplify the complex subject of how the world works by providing a holistic view of the world we are a part of. Thus, the book serves as both a call to awareness as well as a call to action from the grassroots level.

The time for the launch of this book could not be more opportune as nations across the world continue to look inwards to seek answers in the midst of a global health crisis. In many ways, the world had come full circle from the era when humanity was lived on a conjoined supercontinent to the interconnected world of today, where it collectively faces the consequences of wars, climate change, pollution, terrorism, mass migration, extremism, habitat loss, unemployment and of course, global pandemics.

Anholt's ideas of a global co-operative society though appear to be a distant, utopian dream, but his social experiment in the form of Global Vote hints practical possibility that might yield results. If the book aims at positing unique, practical, and innovative ideas on humanity's shared future, then for most parts, it delivers.





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