



## INSIDE THIS EDITION

And yet again, it appears that the festival of lights has passed by as soon as it had arrived. It is a reminder that everything is transient and hence while it is important to plan ahead, it is equally important to live in the moment. Wishing you and yours prosperous and healthy years ahead. Rise and Shine!

In this edition of the Monthly Policy Note, we attempt to look at how 2023 looks given the inflationary scenario, the impact of both the crude prices on economies as well as the geopolitical scenarios. India's attempts towards having further seamless logistics, as well as addressing climate change impacts on the tourism sector are both critical for the economy.

With an intent to promote jointness, the Theatre commands are a key focus area with respect to national security. We also look at both economic and social conditions that tend to have an impact on individual and societal view points.

For our expert section, we have Dr. G Satheesh Reddy, SA to RM, sharing his inputs on the innovation ecosystem in India and his vision for the future.

*"Creativity is seeing the same thing but thinking differently"*

**- Dr APJ Abdul Kalam**

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We hear you!!

Participate in our polls on LinkedIn and tell us what you want to read in the next edition.

You can also write to us at [feedback@primuspartners.in](mailto:feedback@primuspartners.in)

## Policy Square | A Primus Partners initiative to understand the more fundamental questions in policy making

Primus Partners on 28<sup>th</sup> December 2021, launched **Policy Square**, in association with Businessworld.

Policy Square, an initiative by Primus Partners, is a monthly expert interview series wherein key constituents of the public policy ecosystem – senior policy-makers, civil society members, business executives etc. – are interviewed on critical issues and policies of national importance to explore their impact on the country and industry at-large.



With this initiative, we have attempted to engage with experts at various levels within the country's ecosystem. Each expert has brought in a new perspective – all towards enabling India's growth both in absolute and relative terms.



### Looking back...

Policies, Budgets, Geopolitics, Technology, Capacity building and Climate change – subjects that are at the core of India's growth story – subjects that will drive India towards becoming a global leader in various fields in the coming decade...  
...we have covered it all and have spoken with the thought leaders in the respective fields.



### The latest episode...



In our last episode, we were joined by Hon'ble Member of Parliament Dr. Sasmit Patra. Dr. Sasmit Patra is a Member of the Parliament for the second consecutive time from Odisha. He represents the Biju Janata Dal Party and is the National Spokesperson of the party. Dr. Patra is also on the panel of Vice Chairmen of Rajya Sabha.

He also handles the responsibility of the media coordinator of the BJD; Dr. Patra has managed the IT and digital platforms for his party. Recently, he has been appointed as a member of the Consultative Committee for the Ministry of Coal and Mines.

#### [Policy Square with Dr Sasmit Patra](#)

In the conversation on Policy Square, Hon'ble Parliamentarian dived into the nuances of women empowerment, including the social, economic, and political dimensions of women's roles in the private and public spheres, as well as significant legislative efforts pertaining to women's empowerment.





## How will 2023 look?

– Winter seems to be coming but we are confident of our Night’s Watch

As per the latest forecast of IMF, the global slowdown is forecasted from 6.0 percent in 2021 to 3.2 percent in 2022 and 2.7 percent in 2023. One-third of the global economy is expected to see a contraction in the next few years. However, even though the Indian projections have been slashed to 6.8% for FY 2023, a further 0.6% point degrade since July forecast, the country is still positioned better than many of the developed countries and has come out as an outlier.

While Central Banks of major economies are raising interest rates to control price rises, a sustained price rise reflecting impact of disrupted supply chains and rising fold & oil prices has led to stalling growth.

Real GDP, annual percent change	2021	2022	2023
<b>World Output</b>	6.0	3.2	2.7
<b>Advanced Economies</b>	5.2	2.4	1.1
<b>United States</b>	5.7	1.6	1
<b>United Kingdom</b>	7.4	3.6	0.3
<b>Canada</b>	4.5	3.3	1.5
<b>Developing Economies</b>	6.6	3.7	3.7
<b>China</b>	8.1	3.2	4.4
<b>India</b>	8.7	6.8	6.1

Across the world, rising interest rates, increasing inflation and currency losing value against the dollar is increasing the risk of recession. The Government and Central Banks are facing twin challenges: high inflation and sluggish economic growth.

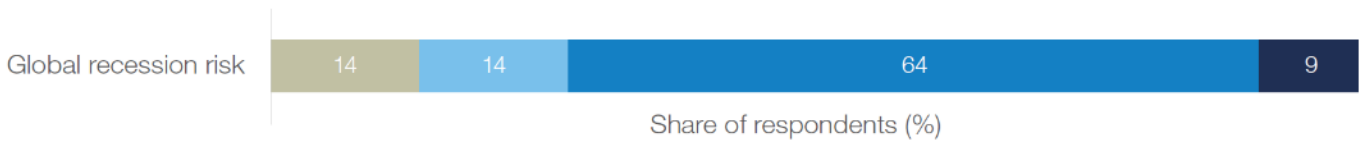
Since the 1991 economic crisis, India has been incrementally integrating into the Global economy. The total external trade of goods and services constituted less than half of the country's total GDP in the first quarter of the current financial year. USA's share in India's merchandise exports has increased to 18.1% in FY 2022 from 18% in FY 2011. The rise of the US market share in India's export basket has increased India's vulnerability to recession in US economy.

However, its impact will not be adverse– since domestic demand is playing an integral role in India's economic growth and recent policies such as Atmanirbhar Bharat, Make in India etc., have acted as a catalyst in this growth journey.

A recent World Bank Report stated that "India has witnessed a rise as result in economic activities and increased consumption in recent months (private expenditure is a key driver of India's growth).

## How likely is a global recession in 2023?

■ Extremely unlikely ■ Somewhat unlikely ■ Neither likely nor unlikely ■ Somewhat likely ■ Extremely likely



**Note:** The numbers in the graphs may not add up to 100% because figures have been rounded up/down.

**Source:** Chief Economists Survey, August 2022

## Road Ahead

While major stakeholders, such as the Government and RBI, are monitoring the situation closely, increasing price pressure along with unemployment remains an immediate threat to the current and future prosperity of the nation. There is a stringent need for fiscal policies to adapt to a more volatile environment by investing in the latest technologies, increasing the horizons of manufacturing, while also continuing to further strengthen the services sector's growth.

As an emerging economy, the country holds the potential to tap the demand-supply gaps in the current market, which itself is recovering from supply chain disruptions due to the global geopolitical developments. The Government of India launched the PLI scheme to boost production and exports for sectors such as telecom, electronics, pharmaceutical drugs, auto parts etc., which in turn is expected to increase the country's production by \$520 billion in the next five years. This in turn will boost employment and productivity in the coming years.

Higher levels of inflation are a huge risk to global growth prospects and hence need to be looked into



**Crude oil in inflationary scenarios**  
– *Missed me? I was never gone!*

Alterations in pattern of functioning of the world, away from the normal, have long lasting consequences. One of the major fallouts of such fluctuations are the accompanying turbulences in the global crude oil market.

Oil price fluctuations are a major source of global economic uncertainty. Changes in the cost of per barrel of oil affect a lot more than just the fuel prices. National inflation indexes, bank monetary policies, amongst many other policy issues walk a delicate balance between the demand and supply of oil in the open market.

After seeing a great recovery in crude oil prices in 2022, oil prices are on a downward trajectory again. The downfall in the global market is being accounted for the fall in demand owing to fresh restrictions imposed in China, crisis in Eastern Europe and rising fears of inflation riding on high food and oil prices. After peaking at \$120 per barrel in the summer of 2022 the prices have since swung below \$100 per barrel, lowest in weeks.

In order to counter the freefall in prices, OPEC has announced a cut in production of oil by 100,000 barrels per day, however, the effect on recovery hasn't been as expected. This is also attributed to the rising speculation around signs of economic recession being seen in most of Europe, with the situation expected to worsen by April 2023. The fresh wave of covid surge in China and the restrictions imposed leading to weakening economic activities have also led to a reduction in demand in the global market. OPEC's move to announce cuts in production also indicates the menace of declining demand.

However, numerous indirect actors are also at play in the oil-inflation debate.

Apart from dips in demand owing to changes in patterns of economic activity, rising investments in mainstreaming the use of renewable energy cannot be ignored. Both US and EU are investing in developing and enhancing renewable energy generation technology. Increasing reliance of the US on shale gas, attempts at developing tidal ocean energy, and a call to shift towards Hydrogen fuel based and electric vehicles will further deteriorate the demand supply equilibrium.



Domestic currency depreciation is also one such factor. While prices in the global market are expected to trade between 83-88 USD per barrel for most of 2023 and upto 1Q of 2024, the devalued local currencies against USD will not take the price benefits home. The story in food prices is similar as well.

Ever since the conflict between Russia and Ukraine has escalated, the proportionate rise in food prices in local currencies is far higher than the corresponding dollar price. The food inflation in South Asia averaged for about 20% while it was between 12-15% for other regions such as East and North Africa, Sub-Saharan Africa, Europe, the Middle

East, Latin America and the Caribbean. The high prices of food and oil in most of the developing economies will not see a downfall unless domestic currencies are strengthened.

The situation is even worse for countries like India, which have a high import dependence. The higher the price of oil in the global market, the greater is the import burden on such countries. With a rising import bill, inflation rises

back home, leading to a reduction in demand, which has negative effects on economic growth. A reasonable reduction in oil prices thus reduces the import burden leading to relaxations in national monetary policy. Decrease in inflation also leaves a greater share of disposable income in the consumer's hands which in turn stimulates demand leading to economic growth.

The geopolitics of oil shapes global narratives in more than one way. From shaping destinies of continents to altering the global order and driving economic policies, oil has an impact on every aspect of national and global governance.

On account of the rising prices, India's import bill had doubled to \$119bn towards the end of March 2022.

If international organisations and forecasts are to be believed, then the downward trend in global crude oil prices is expected to continue for most of 2023 and 2024. However, the magnitude of easing of inflation in India will be directly dependent on the benefits of the price drop being passed to the end consumer by the OMCs.

*While there are multiple alternatives being discussed for crude, it will be a while before crude oil's impact on inflation reduces*



## National Logistics Policy

- Logistics is key for the transition from disorder to order

Prime Minister Narendra Modi announced the National Logistics Policy (NLP) on September 17 2022, aimed at easing the movement of goods and boosting the trade sector in the Indian economy. The Policy is enabled by different technologies and focuses on unified measures across different logistics modes, including roads, rail, ports, airports and warehousing that will give a decisive edge to Ease of Doing Business in India (EoDB).

The logistics industry, accounting for 14.4% of GDP, plays a crucial role in all industries, especially agriculture, manufacturing, and services. The NLP is expected to bring down the logistics cost to around 8% of GDP in the next five years. The policy's single-window logistics e-

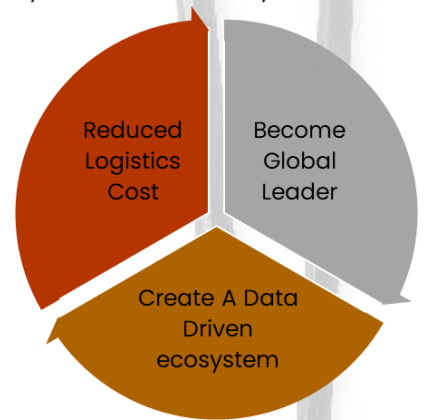
market not only unites the sector digitally, but also eliminates choke points and enhances connectivity throughout the country, especially in the north-east.

It can also assist in identifying and developing new gateways with ports that haven't been used in the past five years. Opening these gateways will ease bottlenecks, reduce inventory costs, and enable fast service delivery.

For capacity-building and making the logistics sector process-driven in India, an integrated digital system will help in a big way for facilitating a unified regulatory environment and policy across the country.

### Few key focus areas of NLP

- **Integration of Digital System**- digital integration of different systems like road transport, railways, aviation, commerce ministries and foreign trade
- **Unified Logistics Interface Platform**- for ensuring a shorter and smoother cargo movement and enabling the exchange of information confidentially on a real-time basis.
- **Ease of Logistics** - the ease of logistics business through transparency and accessibility.



### Challenges and Way Forward towards progression on NLP



**Over reliance on road transport...**

- With almost 65% of the cargo movement being by road, the focus needs to shift to railways for cargo movement which will also reduce costs due to lower fuel conversion

**...but trains as an alternative are relatively slow...**

- Hence, fast moving freight trains (at least 50 kmph) need to be sufficiently introduced into the system soon which will ensure timely delivery as well as reduction of wastage in case of perishables

**...and storage facilities are also a concern**

- Storage facilities are being planned and set up to significantly reduce food wastage

**...and what about last mile connectivity for door deliveries**

- A multi modal system needs to be integrated well enough at the grass roots level
- Integration of railways with roadways / ports terminals and further with retail delivery outlets is critical

The NLP aims to address both the cost as well as the efficiency issues in logistics, especially in the transport, warehousing and inventory aspects of the ecosystem.





## 5G – Reimagining the future of India

– Expected to open new avenues of growth for the Indian economy

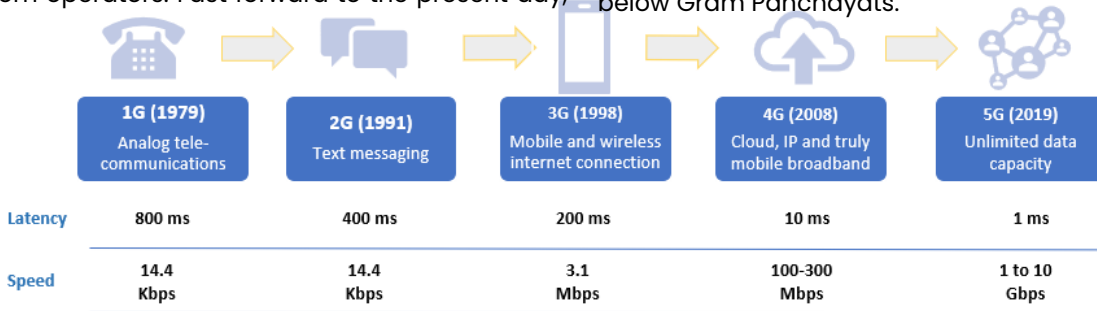
“In the Information age, one tech year is equivalent to one person’s lifetime.” — J.R. Rim

This holds true, especially in the case of wireless mobile internet technologies. Each generation of the internet era has broken new ground, in terms of speed, latency and more importantly, being a catalyst for further pushing the boundaries of technology and innovation. India has traversed this journey through internet generations rather quickly, leveraging best practices from other countries that were early adopters in each generation.

The Indian internet revolution happened in 2017, when telecom operators disrupted the market by launching the industry-lowest 4G data plans with high data transfer speeds. This soon became the main driver for consumers lapping up internet-enabled mobile devices, which has positively impacted the mobile subscriber base and growing data usage per customer for telecom operators. Fast forward to the present day,

where the country has over 700 million active internet users, and this number is expected to grow to 900 million by 2025.

The fifth generation of wireless technology or 5G, with speeds going up to 10 Gbps, opens an entirely new realm of possibilities. 5G is a software-based network using cloud computing, which delivers almost 20x faster performance than 4G, and is expected to deliver 10x better download speed than 4G and up to 3x greater spectrum efficiency. Reduced latency is another key differentiator between 5G and its predecessor. India officially announced the launch of 5G network services during the Indian Mobile Congress event held in October 2022. 5G presents a unique opportunity in India to leapfrog some of the incomplete and legacy infrastructure from previous generations as the cost of 5G data is expected to be relatively cheaper as compared to other countries. BharatNet can also leverage 5G with 1 Gbps of bandwidth to cover villages below Gram Panchayats.



### Global Evolution of 5G

5G provides a platform for validating several hypothesis, products, and solutions in the Emerging Technology space. It allows tech companies to integrate newer features and capabilities while driving innovation. Adoption of 5G is expected to exponentially push demand for Cloud and AI/ML technologies in enterprise solutions. We expect 5G to open up a number of interesting use-cases across industries. Internet of Things (IoT) is expected to revolutionize Healthcare by enhancing patient diagnosis, treatment, and monitoring remotely. 5G can also help telecom operators offer last mile connectivity where a fiber network is not available, helping telecom operators reduce costs and in turn will help them at the bottom line, with time. Another impactful application for 5G is improving the safety within the Automotive industry through vehicle-to-vehicle communications through real-time data computing and analytics. Private 5G is expected to revolutionize how enterprises leverage the network for facilitating connectivity for use cases across verticals and horizontals. 5G is also expected to

address logistical and operational challenges across industries through drone based real-time inventory tracking.

While 5G presents a massive opportunity, there are some fundamental challenges that we need to address. One of the bottlenecks facing the Indian internet ecosystem is the low internet bandwidth of India compared to developed countries. Another issue is the digital divide where growth for telecom operators has been biased in favour of urban areas. Internet penetration in rural India is only around 35%. Since the growth in urban internet consumption has tapered, telecom operators must focus on bridging the digital divide to make 5G a success. Decision makers also need to account for threats to 5G infrastructure, including data security and tampering, hardware vandalism, etc., while ensuring subsidized 5G handsets and data tariffs for rural subscribers under the Universal service obligation scheme of the Indian Government.

5G is expected to be a socio-economic multiplier for the economy by driving financial inclusion in the remotest of geographies as well as supporting SMEs through solutions offering access to credit and financial services.

**Integrated Theatre commands**  
- India is catching up

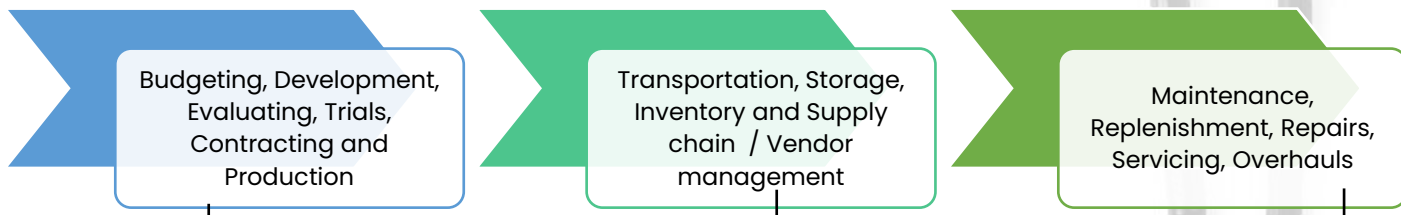
Future wars are expected to be complex, asking solutions for complex logistical challenges, as well as an efficient non-linear approach on the battlefield. Coordination of personnel, supplies, as well as facilities, will be imperative. Integrated Theatre Commands refers to a unified command of the three Services – Army, Air Force, Navy – under a single head especially for areas with high strategic and security concerns.

What the integration of commands will entail includes (1) a unified command with the commander / Chief of Defence Staff having resources of all three services at his disposal and (2) restructuring India’s single service

commands, (3) combining the existing 17 commands across services and (4) being responsible for integrated planning and coordinated application. What it will work towards, are both: (1) the pooling of resources of all three services resulting in optimal utilization, as well as (2) the joint trainings resulting in logistics benefits.

In this write up, we focus on the procurement process, which is a key part of the logistics for defence forces, with respect to the integration of commands.

**Stages in a procurement cycle generally include:**



**...and how an integrated theatre command will make it more efficient:**

- Sustainable model towards optimal utilization of men, materials and money
- Preventing any competing demands over and above overlapping requirements
- Integrated logistics reduce supply chain, transportation and storage costs
- With common vendors, it will also help in reducing costs
- Better inventory management
- Streamlined operations
- Commonality of approach towards MRO

**Important points to be considered when working towards an integrated command**

- Existing chain of command, along with operational command, and control of existing assets
- Budgetary allocations across the three services especially with the varied asset base and resource availability of each service
- Lack of sufficient experience of the services to seamlessly imbibe a revised command structure and operational requirements
- Clarity of roles and responsibilities between the three services in an integrated theatre command





## **Interest rates and inflation**

*- A relationship that should not go sour*

### **Inflation: Price on the rise**

The price being referred to is the average price of nearly all consumer goods and services. A rise in price indicates that the demand for goods and services is exceeding their supply. This also means that more money is pursuing fewer quantity of goods, thus causing a rise in price. Therefore, with demand being higher than supply, sellers are incentivized to charge higher prices, consequently causing rise in inflation rates.

### **Inflation for a growing economy is a healthy sign**

A nominal amount of inflation, of about 3-5% for a growing economy, is a healthy sign. This portrays that consumers are willing to spend money on goods and services rather than saving money. However, a very high inflation can be fatal for the economy as the value of money reduces.

### **The chemistry between inflation and interest rates**

The Central Bank is responsible to maintain the right amount of inflation in the economy. Among other things, one of the main tools that central banks use to keep the price levels in check is interest rates. The government sets benchmark interest rates basis the inflation behavior in the economy. Recessions are primarily characterized by falling incomes, hence falling spending and investment eventually leads to falling GDP growth. Due to this, inflation falls as demand is weak. In such a scenario, the central bank is responsible to get the economy back on track. This is when RBI would decide to lower interest rates.

For individuals, when interest rates are lowered, they are less likely to save- considering that banks will pay a lower interest rate on savings. However, businesses are incentivized to borrow money, and in turn invest it in their business. Hence, when interest rates are lowered, there is an increase in spending and investments, which implies a rise in demand for goods and services, and that causes inflation to go up to desirable levels.

In cases where RBI raises interest rates, individuals shall save more money and businesses would not borrow money since the cost of borrowing has increased, thus lowering inflation rates.

### **Reserve Bank of India hikes interest rates to tame inflation**

The inflation trajectory around the world remains clouded with uncertainties arising from continuing geopolitical tensions and nervous global financial market sentiments. Resultant to the persistent high

inflation, it is necessary to calibrate monetary decisions to restrain broadening of price pressures and anchor inflation expectations. In the battle to tame stubbornly high inflation, the Reserve Bank of India has raised its benchmark repo rate by 50 basis points, the fourth straight increase.

RBI has now raised rates by a total 190 basis points since May, but inflation has continued to remain high – a phenomenon that is affecting much of the global economy. The relentless and aggressive rate rise by the US Federal Reserve over recent months to curb inflation have battered the rupee, and most other emerging and developed market currencies.

Policymakers around the globe are grappling with a sweeping shift away from their respective currencies and into the safe-haven dollar, raising worries of capital outflows and further damage to their economies.

Economists are of the view that RBI shall have to focus on ensuring the interest rate differential is not being very low. The MPC lowered its GDP growth projection for financial year 2023 to 7% from 7.2% earlier, while its retail inflation forecast was held steady at 6.7%.

### **Weaker Rupee to further amplify inflation**

RBI highlighted that the Indian rupee depreciation against the US dollar was one of the risks that could elevate the country's inflation rate. Rupee has dropped more than 8% against the US dollar in 2022, as an aggressive monetary policy by the US Federal Reserve (Fed) has strengthened the greenback, hitting some Asian and emerging-market currencies. A weaker rupee against the dollar could increase the prices of imported goods, thus contributing to rising inflation.

As per RBI, inflation could edge up by around 20 bps if rupee depreciates by 5% from the baseline, although the country's gross domestic product (GDP) could be 15 bps higher due to a boost to exports. And vice-versa, if rupee appreciates by 5% against the baseline, inflation and GDP growth could moderate by 20 bps and 15 bps, respectively.

### **It is critical for the central bank to walk a tightrope as it balances between inflation management while sustaining the growth impulses in the economy.**



## Social Determinants of Health (SDOH)

- A wholistic view towards looking at Health

In a simplistic way, **Social determinants of health (SDOH)** are the conditions in the environments where people are born, live, learn, work, play, worship and age, that affect a wide range of health, functioning, and quality-of-life outcomes and risks.

The word **Health**, according to the World Health Organization (WHO), is "a state of complete physical, mental and social well-being and not merely the absence of disease and infirmity". Thus, the word Health encompasses much more, importantly, it is influenced by several other factors beyond medical science.

Having recognized this, in 2008, the WHO Commission on SDOH published a report entitled "Closing the Gap in a Generation", which identified two broad areas of social determinants of health, daily living conditions being the one encompassing factors such as healthy physical environments, fair employment, access to health care etc. Whereas the second major area was the distribution of power, money, and resources factoring in action on the social determinants, economic inequalities, gender equity, political empowerment etc.

Thus, the following elements are said to be part of the SDOH:



Studies have shown that SDOH accounts for between 30% to 55% of Health outcomes. Further reduction of mortality in the under-5 age group has been attributed to 50% of the investment outside the health sector, showing the importance of the SDOH in people's lives.

However, just promoting healthy choices won't eliminate health disparities. Instead, the Government and other enterprises in sectors like education, transportation, and housing need to take action to improve the conditions in people's environments.

Another intriguing truth is that pursuing SDOH makes it possible for individuals and governments to strive toward reaching 10 of the 17 SDGs, making SDOH an even more crucial factor.



Years of studies have shown three major interventions which can be implemented towards improving SDOH which are:

**Education:** Many scientific studies have been conducted and strongly suggest that increased accessibility and quality of education leads to benefits for both the individual and society. One of the success stories in India, Sarva Shiksha Abhiyan (SSA) launched in 2001, has led to Gross Enrollment Ratio (GER) reach 98.85%, 98% of the habitations have a primary school within 1km whereas 92% have an upper primary school within 3km etc.

**Social Protection:** Interventions such as "health-related cash transfers", maternal education, and nutrition-based social protections, have been shown to have a positive impact on health outcomes. The implementation of the Ayushman Bharat Scheme, has led to a 21% decline in out-of-pocket health expenditure and an 8% reduction in the tendency to borrow emergency loans for health purposes, among poor households.

**Urban Development:** Urban development interventions include a wide variety of potential targets such as housing, transportation, and infrastructure improvements. The government of India's schemes such as Swachh Bharat Abhiyan, Smart Cities Mission, AMRUT, Jal Jeevan Mission are among the initiatives implemented for urban development and improving east of life for citizens.

However, it is worth noting that many economic studies have been conducted to measure the effectiveness and value of social determinant interventions but are unable to accurately reflect effects on public health due to the multi-faceted nature of the topic.

*All populations benefit greatly, especially the most vulnerable, when SDOH are considered first, and integrated with traditional healthcare applications using digital technology to help mitigate the lack of healthcare equity.*



## Climate change and tourism

- Required to follow a multisectoral approach for sustainable tourism

According to the World Travel & Tourism Council, tourism's contribution to global economy could potentially reach ~\$8.6tn in 2022. In India, the sector is projected to contribute \$512bn to GDP by 2028 and account for 53 million jobs by 2029 (as per Invest India estimates). Its contribution to GDP and employment makes it a crucial pillar in the world economy.

**Tourism, as a sector, is intricately linked with climate change.** Extreme weather events, triggered by climate change, may impact the tourism industry through increased infrastructure damage, changes in water availability, altered landscapes, coastal erosions and inundations and business disruptions among others. For instance, in the US, the \$12.2bn ski and snowmobile industry has experienced over \$1bn of losses due to altered weather patterns. Similarly, in Kerala, the 2018 floods caused destruction of ~INR 31,000cr worth of infrastructure.

**While tourism is considered as a highly 'climate-sensitive economic sector' due to its vulnerability, it also has a significant environmental footprint.** The sector accounted for 8% of global GHG emissions from 2009 to 2013. Considering the close connection between climate change and tourism, it is essential to build the sector's resilience, particularly in developing countries such as India where tourism industry is a key driver of socio-economic development.

Given that a resilient tourism sector will be instrumental in reducing the industry's climate impact, it is essential to undertake measures that would not only **enable the sector to adapt to the changing climate, but also lead to reduction in sectoral emissions in the short- and long-term.** This could be achieved through few targeted interventions including:

✓ **Climate change vulnerability assessment of tourism sector across states and UTs should be incorporated into the National Tourism Policy.** India's Draft National Tourism Policy 2022, recognizes the need to mainstream sustainability into tourism, through the proposed National Green Tourism Mission. Considering the unique tourism experiences that every state/UT has to offer, **it is essential to conduct a vulnerability assessment of tourism in the respective state,** to make the sector climate resilient while enabling reduction of emissions. This will ensure consistency in planning and implementation of state level tourism assessments, with convergence of benefits at the national level. It will also provide a regulatory framework for the sector and its subsidiary sectors.



✓ **Integration of climate resilience into existing and new tourism infrastructure to enable assets such as roads, airports, cultural sites, and hotels to withstand climate change linked extreme weather events.** Building new infrastructure and repairing existing ones are energy intensive activities and contribute to GHG emissions. Therefore, climate resilient and green infrastructure that consider climate risks and can withstand the changing climate is the need of the hour for the sector.

✓ **Upgradation of existing infrastructure to promote and integrate sustainability in local by-laws.** Infrastructure initiatives like (1) development of adequate walking and cycling infrastructure, (2) including trails and public transport services in cities, and (3) Inclusion of Tourism enterprises in local by-laws for water and waste management procedures. Such initiatives will assist in decarbonizing tourism operations.

✓ **Facilitating green investments and access to capital particularly for tourism MSMEs.** According to the ILO, ~80% of tourism businesses are MSMEs. The government, through the proposed National Green Tourism Mission, could channelize funds to MSMEs, particularly small hotels and businesses - to be utilized for implementing energy and water saving measures, waste reduction techniques, and training of staff on sustainable tourism practices. This will also provide the necessary support to MSMEs in market access and development.

✓ **Identification of 'ecotourism hubs' across the country, taking into consideration the ecological fragility of the area and aesthetics.** For instance, ecotourism has been designated as a 'thrust industry' in Jammu & Kashmir, Sikkim, Himachal Pradesh, and Uttarakhand. The government is providing a range of incentives for ecotourism projects in these places. There is a need to identify more such locations in the country, both at the local and national level.

*Tourism has a significant multiplier effect on the economy. Therefore, a sustainable tourism sector is of utmost importance in ensuring sustainable development and long-term social and economic growth.*





## Advanced materials, innovative manufacturing and unmanned systems are three priority technology areas



**Dr. G Satheesh Reddy is the Scientific Advisor to Raksha Mantri (SA to RM). Dr Reddy has donned various hats within the scientific and innovation ecosystem in the country both as a distinguished scientist as well as in his prior role as the Secretary, DDR&D and Chairman, DRDO. He has also been instrumental in driving the indigenous design, development and deployment of diversified missiles & strategic systems, guided weapons among other technologies.**

**As a national objective, exponential growth in engineering and technology are critical for India to grow at the desired pace. As the Scientific Advisor to Raksha Mantri, what are the three priorities in defence technology that you envision India becoming a world leader in within this decade?**

Development of many indigenous, advanced technologies is the key to becoming a world leader. Presently, India is aiming to become self-reliant in critical technologies through the Make in India program and minimize import dependency. The country has become self-reliant in many defence technologies and is confident that existing technological gaps in certain critical, advanced technologies will be filled in the next few years.

Development of advanced technologies and systems is the only way to become a world-leading exporter of defence equipment. Many efforts are being made to achieve the same in this country. The synergetic approach between academia, R&D organizations and Industries is currently being pursued in the design, development, and manufacturing of innovative, next-generation defence equipment. R&D organizations are working on various system's development through applied and translation research, in which industry has also started participating in a big way. **The three priority technologies that will make us world leaders are technologies of advanced materials, innovative manufacturing and unmanned systems.**

The country has taken up many initiatives to achieve these three priority technologies. Further, many other key areas such as advanced fighter aircrafts, aero engines, armoured vehicles, space-based systems, cyber systems, high power electro-magnetics, lasers systems, secured communications using quantum technologies, and terahertz technologies are also being given greater focus.

**A Cluster based approach works better for growing industries as it results in synergy and an integrated ecosystem. With respect to S&T clusters in India, what are the policy interventions being planned to increase investments – especially with respect to manufacturing?**

Many countries around the world have adopted cluster-based philosophy to speed up their

technological innovations. Industries working in similar technological areas can optimize their synergy effectively if they are positioned in the same area.

Academic institutes located nearby can be involved with these industries in research and development to translate innovative technologies from TRL 1 to 4 or higher levels. In addition, they can also offer specific technological courses to impart specialized skill development to help industries in clusters. There are many such successful clusters exist in the world. Particularly in the United States, Detroit for automobiles and Silicon Valley for computing, where innovative institutes support and bring the best technological solutions and academic institutions facilitates innovation and higher skill set development.

One example in India is the Coimbatore Textile cluster called South India Textile Research Association (SITRA)". It is governed by a council consisting of Industry, government, and scientists and focuses on research, development and knowledge-based services in current and evolving textile technologies.

The government has created two such clusters called Defence Industrial Corridors (DIC), one in UP and the other in Tamil Nadu. These will bring together the defence industries, test labs, R&D institutes and academia in these areas. Academic institutes around that area will also support skill developments in the defence industrial corridors. Furthermore, a lot of support measures have been taken for these corridors, such as making it easy to get land, permissions, and infrastructure facilities to help the industries. In the coming years, I am confident that defence manufacturing will be able to come up faster and take manufacturing to greater heights.

**India has made significant headway in indigenizing defence technologies across all segments but especially in missiles. What do you think are the key reasons that enabled the success in missiles segment and how can it be further replicated across other areas – especially in aerospace and critical areas like semiconductors and engines?**

Yes. India has done very well in missiles. Many missiles have been developed, such as surface-to-surface missiles, surface-to-air missiles, air-to-air missiles, anti-tank missiles and many other systems.

The indigenous content in these systems is very high, and the country has the complete capability to design, develop, and produce in large numbers as well.

Not just missiles presently, there are many other defence technologies in which the country have become self-reliant. **Today we are completely self-reliant in Radar systems, Electronic warfare systems, AEW&C systems, Sonars, Torpedoes, Armored vehicles and Artillery guns.**

As LCA production is going on, our technical expertise in fighter aircrafts is also phenomenal and we aim to develop next-generation fighter aircrafts. A lot of work is being done in many other advanced technology areas, especially in Space, Cyber, Materials development, Quantum technologies, High-energy Lasers and Communications systems, and other areas.

We also need to concentrate on technologies like aero engines, advanced materials and manufacturing technologies. We also need to have the semiconductor and MEMS manufacturing capabilities for various devices, sensors, and detectors. Semiconductor technology up to 200 nanometers has already been established in the country. We need to soon establish our ability to reach the levels of better than 10 nanometers. Lots of material-related research is going on through multiple organizations and laboratories. These efforts will help the country become self-reliant in these technologies in the coming years.

**Having donned various hats within the Indian R&D ecosystem till date, what according to you are the top three initiatives that will drive India's R&D culture in defence.**

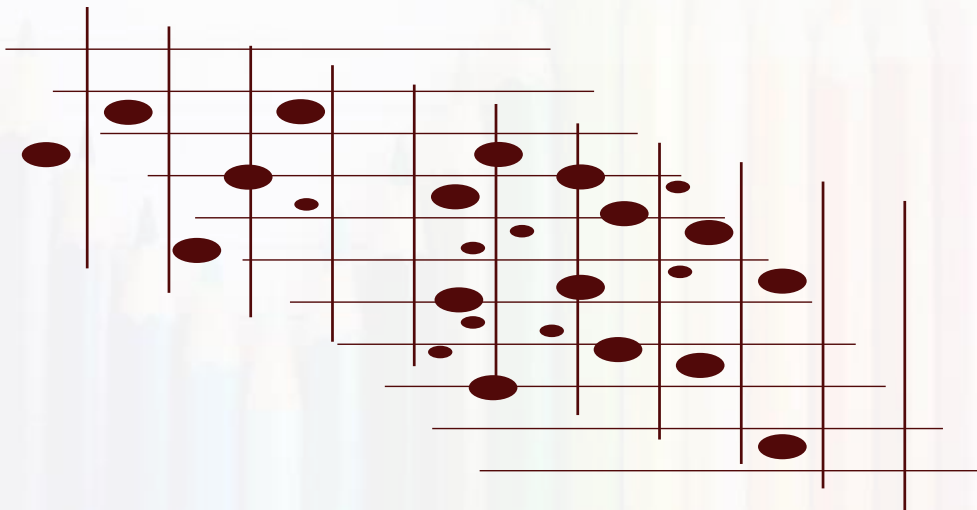
The defence R&D in the country is at a good level, where we can design and build advanced technology-

based systems. Many advanced systems, like fighter aircrafts, air-independent propulsion systems, artillery guns, missiles and radars, are made in the country. Lot of work is also being done in the areas of quantum technologies, advanced and smart materials, artificial intelligence, cognitive technologies, devices, sensors, detectors, and high-power sources.

We need to work with academia much more vigorously to carry out research in advanced technological areas. Core research needs to happen in academia, and the professors who want to do in-depth research need to be encouraged. We need to work on technologies for tomorrow through various collaborations and partnerships with other institutions around the world. We should also encourage the industry to carry out R&D in realizing the advanced systems. Lot of measures have been taken in this direction by the government. Twenty-five percent of the Defence R&D Budget is allotted for academia and industry in defence research and development.

Another important thing is to engage and encourage startups in a big way by promoting, supporting and mentoring them and providing the necessary test facilities. The schemes like iDEX and TDF are introduced to help industries, especially startups and MSMEs, in a big way to do research and development and come up with innovative systems. The R&D organizations should focus on the development of advanced critical, large and complex systems by taking the leap from the core research of academia and involving the industry from the beginning. These are the major steps we need to take to ensure that the country will lead the world in the future.

Thank you. Jai Hind.



## About Primus Partners

Primus Partners has been set up to partner with clients in 'navigating' India, by experts with decades of experience in doing so for large global firms. Set up on the principle of 'Idea Realization', it brings to bear 'experience in action'. 'Idea Realization'— a unique approach to examine futuristic ideas required for the growth of an organization or a sector or geography, from the perspective of assured on ground implementability.

Our core strength comes from our founding partners, who are goal-oriented, with extensive hands-on experience and subject-matter expertise, which is well recognized in the industry. Our core founders form a diverse cohort of leaders from both genders with experience across industries (Public Sector, Healthcare, Transport, Education, etc.), and with varied specialization (engineers, lawyers, tax professionals, management, etc.).



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