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YOJANA

JULY 2020 A DEVELOPMENT MONTHLY ₹ 22

LEAD ARTICLE
Ethical Wealth Creation for a Self-reliant India
Dr Krishnamurthy V Subramanian
Surbhi Jain

FOCUS
Making Farmers Self-Reliant
Dr Jagdeep Saxena

SPECIAL ARTICLE
Resilient Health Systems
Dr Manisha Verma, Siddhartha Kumar

JAM Trinity
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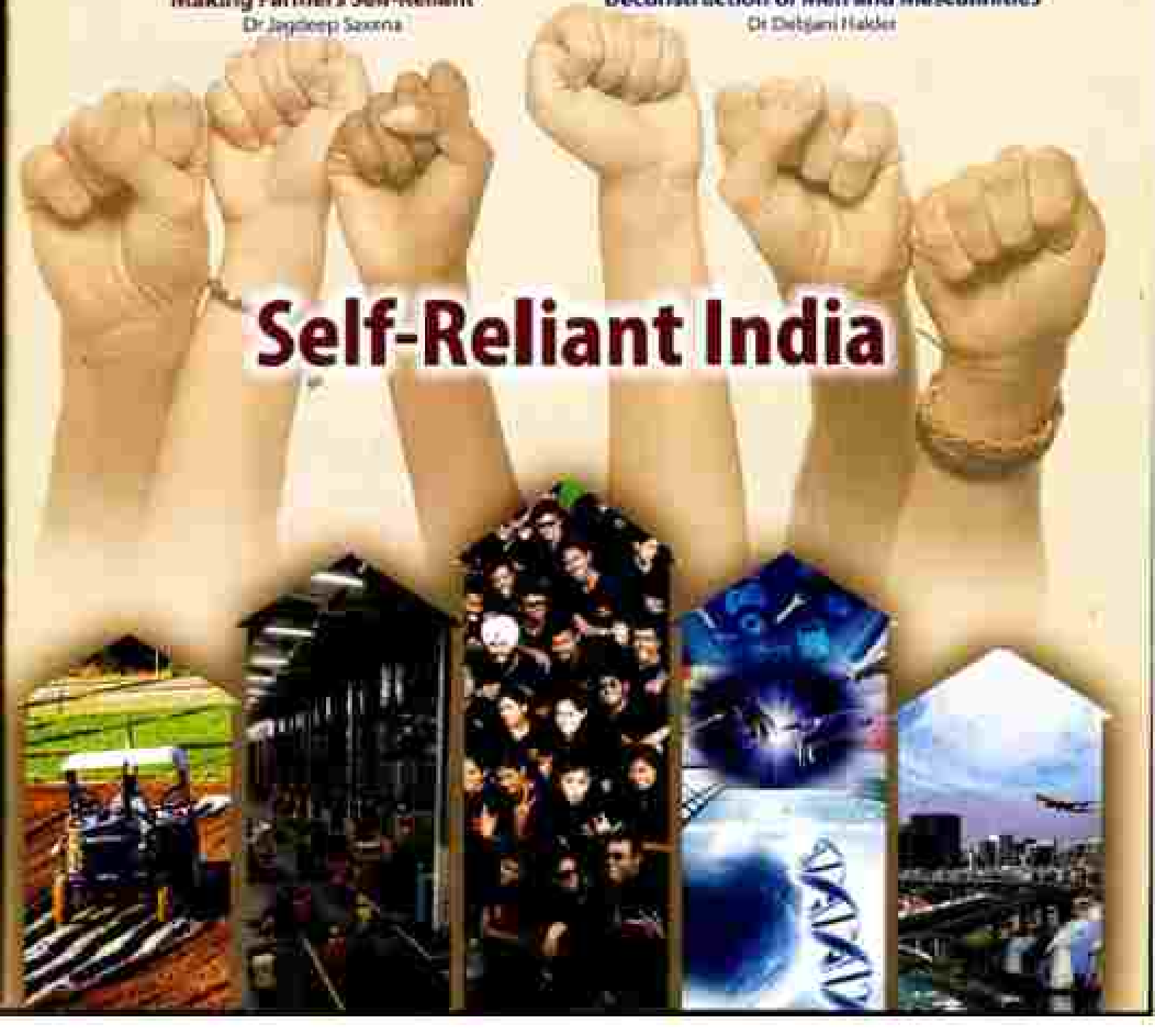
Satyajit Ray's Films: Deconstruction of Men and Masculinities
Dr Debjani Halder



Self-Reliant India

Transforming Agriculture Sector

A visionary step towards transformation of agriculture and raising farmers' income is taken in form of the historic amendment to the Essential Commodities Act.

With this amendment, commodities like cereals, pulses, oilseeds, edible oils, onion and potatoes will be removed from list of essential commodities. This will put aside fears of private investors of excessive regulatory interference in their business operations.

The freedom to produce, hold, move, distribute and supply will lead to harnessing of economies of scale and attract private sector/foreign direct investment into agriculture sector. It will help drive up investment in cold storages and modernisation of food supply chains.

Safeguarding Interest of Consumers

The Government, while liberalising the regulatory environment, has also ensured that interests of consumers are safeguarded. It has been provided in the Amendment, that in situations such as war, famine, extraordinary price rise and natural calamity, such agricultural foodstuff can be regulated. However, the installed capacity of a value chain participant and the export demand of an exporter will remain exempted from such stock limit imposition so as to ensure that investments in agriculture are not discouraged.

The amendment will help both farmers and consumers while bringing in price stability. It will create competitive market environment and also prevent wastage of agri-produce that happens due to lack of storage facilities.

The Farming Produce Trade and Commerce (Promotion and Facilitation) Ordinance, 2020

The Ordinance will create an ecosystem where the farmers and traders will enjoy freedom of choice of sale and purchase of agri-produce. It will also promote barrier-free inter-state and intra-state trade and commerce outside the physical premises of markets notified under State Agricultural Produce Marketing legislations. This is a historic step in unlocking the vastly regulated agriculture markets in the country.

It will open more choices for the farmer, reduce marketing costs for the farmers and help them in getting better prices. It will also help farmers of regions with surplus produce to get better prices and consumers of regions with shortages, lower prices. The ordinance also proposes an electronic trading or transaction platform for ensuring a seamless trade electronically.

The farmers will not be charged any cess or levy for sale of their produce under this Act. Further, there will be a separate dispute resolution mechanism for the farmers.

One India, One Agriculture Market

The ordinance basically aims at creating additional trading opportunities outside the APMC market yards to help farmers get remunerative prices due to additional competition. This will supplement the existing MSP procurement system which is providing stable income to farmers.

It will certainly pave the way for creating One India, One Agriculture Market and will lay the foundation for ensuring golden harvests for our hard working farmers.

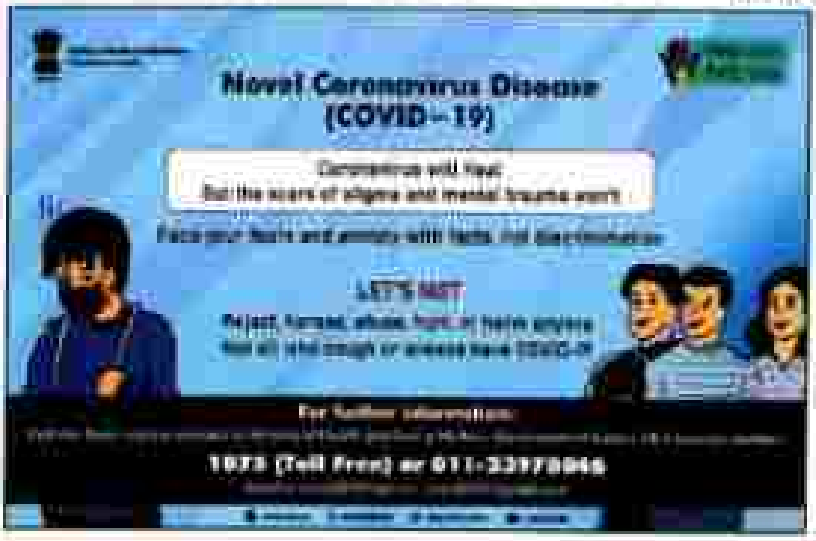
The Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Ordinance, 2020

Indian Agriculture is characterised by fragmentation due to small holding sizes and has certain weaknesses such as weather dependence, production uncertainties and market unpredictability. This makes agriculture risky and inefficient in respect of both input & output management.

The ordinance will empower farmers for engaging with processors, wholesalers, aggregators, large retailers, exporters etc., on a level playing field without any fear of exploitation. It will transfer the risk of market unpredictability from the farmer to the sponsor and also enable the farmer to access modern technology and better inputs. It will reduce cost of marketing and improve income of farmers.

This Ordinance will act as a catalyst to attract private sector investment for building supply chains for supply of Indian farm produce to global markets. Farmers will get access to technology and advice for high value agriculture and get ready market for such produce.

Farmers will engage in direct marketing thereby eliminating intermediaries resulting in full realisation of price. Farmers have been provided adequate protection. Sale, lease or mortgage of farmers' land is totally prohibited and farmers' land is also protected against any recovery. Effective dispute resolution mechanism has been provided for with clear time lines for redressal. ❑



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YOJANA

Since 1956 A DEVELOPMENT MONTHLY

Let noble thoughts come to us from all sides
Rig Veda

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YOJANA is published in Assamese, Bengali, English, Gujarati, Hindi, Kannada, Malayalam, Marathi, Odia, Punjabi, Tamil, Telugu and Urdu.

Inbox

Digital Yojana

I am a regular reader of Bengali and English Yojana. But coronavirus pandemic and lockdown interrupted the habit. I found the digital version of the Yojana June issue and read it eagerly. The cover story of this issue was "Technology", and various contemporary and relevant subject/ topics are well-written for readers of all sections.

– **Tapomoy Ghosh**
Katwa, Purba Bardhaman
tapomoyghosh22@gmail.com

Authentic Information

In today's world, data is easily available but authentication is not there. Yojana gives a clear picture of society, government, bold decisions with a way forward approach. In SSB interview of armed forces, tasks such as lecturette, group discussion, and interview demand a comprehensive analysis. I started reading Yojana following the advice of my teacher Debesh Sir. I read articles and note them down. Thank you team Yojana for your efforts during this pandemic. You are the source of my confidence whenever I talk with anyone on issues.

– **Ashis Kumar Panda**
Berhampur, Odisha
ashishkumar42p42@gmail.com

Contemporary Issues

I really liked the issue "Constitution of India". Important aspects were covered very well as they are of contemporary relevance. Also, the easy to understand writing style is praiseworthy. I request you to please bring an issue on India's internal security. It can enable us to understand and appreciate the role of our security forces and the government's foreign policy in that regard.

– **Priya**
booksandnotesofpriya@gmail.com

Suggestion on Theme

First of all I would like to thank the Yojana team, who really works hard for providing us valuable & highly rich content. I request you to please publish a Yojana edition related to – "Internal security & challenges, impact of communication network, role of media and social networking sites in internal security, role of money laundering and its prevention, security challenges and their management in border areas, linkages of organised crime with terrorism & various security forces and agencies and their mandate."

– **Manish Kumar Maurya**
New Delhi
mkjgl1996@gmail.com

An Edition for Children

I have been an avid reader of Yojana magazine for quite sometime. For a civil services aspirant like me, this magazine is nothing short of a bible. I would like to thank the Yojana team and MoI&B for bringing out this magazine uninterruptedly even in these difficult times. I would request the team to bring out Yojana editions on topics like Indian art and culture, diversity, history, society, international relations. It would be really helpful in shaping the future minds of the country if Yojana would come up with a kid's edition. Thank you.

– **Bharath**
Bengaluru, Karnataka
bharath9881623@gmail.com

Idea of India

Whenever I read Yojana, I feel more and more connected to our country. The quest to know the very Idea of India increases while reading the articles. Every UPSC civil service aspirant want to know about the country and Yojana is doing that very effectively. I would like to request you to please publish Yojana edition on- "migrant issues, environment and human health, neighbourhood foreign policy issues". Thank You.

– **Manish Meena**
manishkumarmeena615@gmail.com

Self-Reliant India

I am a regular reader of Yojana that covers diverse topics. I want to suggest that please cover Prime Minister's "Make In India for World" ambition and present and future challenges and opportunities for India to become "self-reliant" in your upcoming issue.

– **Abhiranjan Maddheshiya**
Khalilabad, Kushinagar (U.P)
abhiranjankumar00@yahoo.com

Nurturing Self-Reliance

The basic thrust for any species around the world is to make their off-spring self-reliant. The birds teach their nestlings to gather food and spread their wings, humans nurture their young ones from birth to till time they are old enough to earn a living, providing them food, shelter, education and guidance all through their growing age.

The same pattern is followed among families, communities, societies, and nation at-large. Self-reliance for a country is equipping it with a self-sustaining ecosystem of abundant produce with employment and growth opportunities for all.

The world is facing an unprecedented turmoil. Pandemics have come and gone over the centuries, but it has never made the people and countries around the world struggle collectively with crumbling economies and a grim job which we are seeing lately. India, with its basic ethos of *Vasudhaiva Kutumbakam*, the world is one family, arrives to stand with the world. Also, it is equally important for each of these family members to be in a position support oneself and then the larger family.

The action plan for a Self-Reliant India hence is envisioned at a pertinent time. The five pillars of Aatmanirbhar Bharat – Economy, Infrastructure, System, Demography and Demand are aimed with a bird-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 through optimum utilisation of resources. These reforms when implemented well have the potential to negate the challenges posed by COVID-19 scenario in the short-term and taking the economy to new heights in a longer run. It will ensure cost-effective localised solutions, quality products and efficient systems, making farmers, industries and youth self-reliant, thus equipping the country for competition in the global supply chain.

The initiatives and schemes undertaken in last few years have already paved the way for this journey towards making India Self-Reliant. Be it JAM Trinity of taking the benefits to the last mile, Start-Up India for creating ecosystem for young entrepreneurs, the push for Make in India, they laid early foundation of this phase. Achieving self-reliance in the production of PPE kits in such a short span of time is another breakthrough in this regard.

Leaving our readers with a wide range of articles on the subject, I would conclude with these lines from an essay on Self-Reliance by Ralph Waldo Emerson (1841)- "There is a time in every man's education when he arrives at the conviction that envy is ignorance; that imitation is suicide; that he must take himself for better for worse as his portion; that though the wide universe is full of good, no kernel of nourishing corn can come to him but through his toil bestowed on that plot of ground which is given to him to till... It is easy to see that a greater self-reliance must work a revolution in all the offices and relations of men; in their religions; in their education; in their pursuits; their modes of living; their association; in their property; in their speculative views."

Ethical Wealth Creation For A Self-reliant India

Dr Krishnamurthy V Subramanian
Surbhi Jain

Dreaming of a self-reliant India (आत्मनिर्भर भारत), Mahakavi Subramania Bharathi wrote	
கங்கை நதிப்புறத்துக் கோதுமைப் பண்டம் காவிரி வெற்றிலைக்கு மாறுகொள்ளுவோம் சிங்க மராட்டியர்தம் கவிதை கொண்டு சேரத்துத் தந்தங்கள் பரிசளிப்போம்	Gangainadhipurathugodhumaipandam, kaaviriverrilaikkumarukolvom, singamarattiyarthamkavithaikondu, serathuthanthangalparisalippom.
(Translation) Let us exchange wheat from the Gangetic plains for betel leaves from the Kaveri delta and the poems from the brave Marathas for the sandalwood from the Chera region.	
Following the dream of patriots like Subramania Bharathi, India must become a self-reliant economy. This need has been clearly highlighted by the COVID-19 pandemic, which has exposed several economic weaknesses across the world.	

आत्मनिर्भर भारत के लिये आत्मनिर्भर नागरिक – "Self-reliant Citizens For Self-reliant India"

The wealth of nations stems from the drive and creativity of its people. A self-reliant India will be built by self-reliant citizens. India is a family of 130 crore Indians. If each one of the family members gainfully contributes to the economy and thereby Rashtra Nirman, then our population becomes our collective strength and not a weakness. Citizens that energetically contribute–with confidence in their own capability–will be able to even move mountains. A person becomes independent if s/he has skills and can earn their own livelihood. Government needs to facilitate this by providing opportunities for skilling.

For Indians to be self-reliant, the social compact between the Government and citizens has, in essence, to be one where "government actively supports personal responsibility, rather than government support substituting personal responsibility or community responsibility." Active government support for self-reliant citizens requires that citizens to retain their personal drive and dignity as part of this compact. Therefore, subsidies, especially those that go to the relatively well-off, cannot be consistent with a self-reliant India.

The expenditure that is spent on subsidies must instead be utilised for education and continuous skill/resource development of our citizens. Equipping the economy with modern techniques and technologically training the nation's youth on an extensive scale are indispensable for the construction of a self-reliant India.

रोज़गार से समावेशी विकास – Inclusive Growth Through Employment

A self-reliant economy has to mean self-reliance for each and every member of our population. So the most important objective of a development strategy that focuses on self-reliance is inclusive growth. As gaping inequalities in various countries demonstrate, GDP growth cannot be the sole objective of economic development. Trickle-down economics—which holds that if GDP goes up, the incomes of all (or most) will, too—simply does not seem to work. For instance, in many countries and sectors, incomes of unskilled workers have stagnated even while the sector (country) has experienced growth in its sectoral contribution (GDP). Such an inequitable pattern of economic development cannot be consistent with a self-reliant India. Self-reliance can only be achieved through economic policies that increase equality while generating growth. Seeing equality and growth as complements rather than substitutes has to be the transformative change we have to bring in our economic strategy for a self-reliant India.

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Employment generation is central to inclusive growth. When one person in a family gets a job in the formal sector, the entire family gets uplifted economically and socially. Moreover, such formal sector employment for one member of the family contributes to mobility of future generations as the kids are likely to get better education and healthcare facilities and thereby uplift themselves. Leaving large fractions of the labour force underutilised or unutilised is extremely inefficient for the economy as the output they can contribute remains untapped.

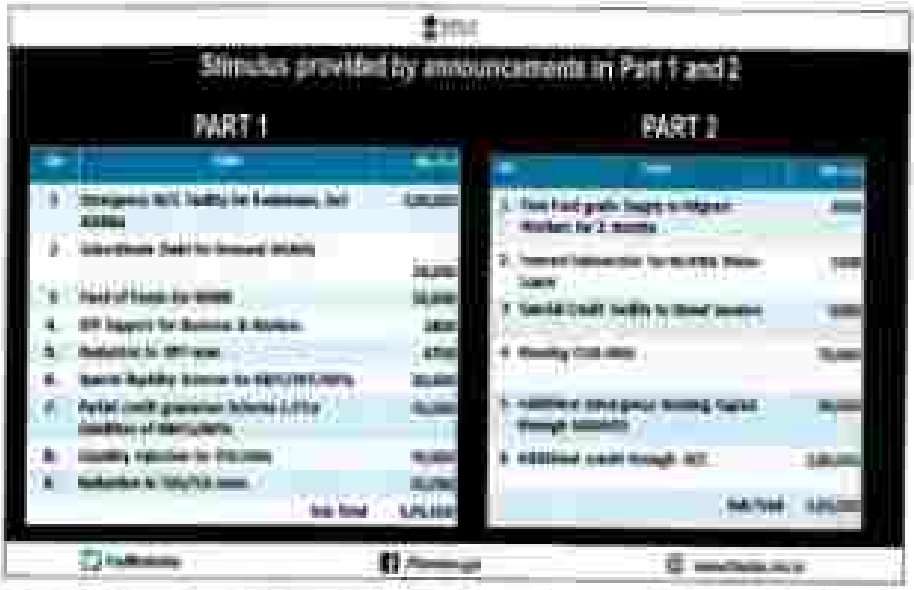
[illegible] – Wealth And Skill Through Private Enterprise And Government

Self-reliance means recognising the complementary roles of the private sector and the government. Specifically, self-reliance cannot be achieved without recognising that market forces and private enterprise can take care of our needs during normal times. As market forces allocate resources based on prices and profits, they promote economic efficiency in normal times. Therefore, promoting private enterprise has to be an important component of self-reliance. The very idea of "*Shubh-Laabh*" (Prosperity & Profit) is that profit is not pariah but at the core of human endeavour and that social-prosperity and business-profit cannot exist in isolation from each other. Self-reliance, therefore, does not mean a return to the "License Permit Raj"; nor does it mean that Government itself will once again occupy the "Commanding Heights." In fact, Indian businesses have always clubbed *Riddhi* (Wealth and prosperity) and *Siddhi* (skill) together, thereby internalising the fact that expertise and success cannot be decoupled. Specifically, the Government to build self-reliance must support the development of *Riddhi* and *Siddhi* in the following ways:

1. Our citizens learn skill, which is Siddhi (सिद्धि).
2. We must support our MSMEs and SMEs by providing them skilled labour. The Siddhi (सिद्धि) of workers will create Riddhi (ऋद्धि) for both MSMEs and workers.
3. We must invest in R&D and innovation like Digital Economy, Medical Research. All [illegible]
4. We must endeavour to reach new technological heights by using earth's resources meaningfully (सिद्धि).
5. We should aim to help the rest of the world through both ऋद्धि and सिद्धि.

At the same time, as the current COVID-19 crisis has demonstrated, market forces and private enterprise can often be too slow or incapable to step up during calamities and war-like situations. If markets and private enterprise could take care of all societal needs, then there should have been no shortage of masks, sanitizers or protective equipments. After all, the humongous demand for these items should have provided adequate incentives for the private sector to produce them in sufficient quantities and thereby avoid the possibility of shortage. However, the acute shortage of such items emphasises the need for a model of economic development that ensures self-reliance. Therefore, in strategic sectors such as healthcare, life-saving medicines, payment systems, mobile communication and defence, government must retain economic presence through one or two public sector firms. More broadly, self-reliance implies that the Government has to identify the critical sectors and ensure manufacturing capabilities in these sectors.

While the role of Government in development has been viewed as inefficient, recent learning in India alleviates such concerns. For instance, the Jan Dhan Yojana is contributing critically in enabling Direct Benefit Transfers to the poor and vulnerable during these uncertain



times. Similarly, the Swachh Bharat programme has been successful in bringing about an awareness of cleanliness and has also generated positive outcome on the health outcomes.[1] Both these programmes achieved outcomes that would not have been possible through private enterprise. This clearly demonstrates that over the years, we have learned how to reduce the risks of failure and increase the chances of success in government programs. Nevertheless, as the role of government in making India self-reliant is pivotal, our efforts have to also focus on increasing the efficiency and efficacy of government, which includes overall governance.

Produce For The Bottom Of The Pyramid

Self-reliance means that Indian firms focus on producing goods and services that cater to the needs of our huge population. As Indian academic C K Prahalad had highlighted, significant fortune lies at the bottom of the economic pyramid. However, tapping into this fortune requires tailoring the product to the customer's pocket. The sachet revolution-packaging the shampoo, toothpaste or hair oil in small sachets that could be easily afforded by the poor-represents a brilliant example of such a product. The poor may not have the financial wherewithal to buy products in large volumes. However, they also rightly aspire to consume products that the rich in India use. Therefore, the development strategy for a self-reliant India can benefit from small and medium enterprises producing goods and services that are tailored to the needs of the large number of consumers at the base of the income pyramid.

The business models that Indian firms generate in catering to the needs of the poor can enable them to tap into markets in many under-developed economies in Asia and Africa. Therefore, by creating development models that cater to the needs of the poor consumers, a self-reliant India can help others and thereby occupy its rightful place in a global economic power.

A self-reliant economy has to mean self-reliance for each and every member of our population. So the most important objective of a development strategy that focuses on self-reliance is inclusive growth. As gaping inequalities in various countries demonstrate, GDP growth cannot be the sole objective of economic development. Trickle-down economics—which holds that if GDP goes up, the incomes of all (or most) will, too—simply does not seem to work.

Importance of Agriculture For A Self-reliant India

Agriculture is crucial to India's economic transformation. Increasing productivity and output in the agricultural sector would, beyond improving food security and the balance of payments (through reduced food imports and increased exports), sustain agro-processing, the manufacturing of agricultural inputs, and a host of services upstream and downstream from farms, creating employment and boosting incomes across the economy. There are opportunities for increasing exports of agricultural goods; the transformation should entail identifying high-value-added crops for which there is a demand elsewhere. Moreover, agriculture can be very advanced technologically, serving as a basis of learning, with some of the skills having applicability to other areas. Indeed, there are ample opportunities for non-labour-saving innovations—better crop mix, better fertilizers, better seeds, better planting patterns. The transformation of farming from traditional practices to modern farming can be an example of general societal transformation entailing modernization.

Successful agricultural transformation will reduce the pressure arising from urban migration and the dilemmas it poses—for instance, whether to use scarce resources to build urban infrastructure, including housing. With limitations on the ability to create urban manufacturing jobs, excessive migration can be very destabilising. And finally, the increase in productivity in agriculture will result in higher incomes, giving rise to multiplier effects and supporting increase in aggregate demand.

Time to 1930 — India Must Rediscover Its Spiritual Ethos Of Ethical Wealth Creation

As climate change presents an existential challenge to the planet, a responsible developmental strategy should not ignore its impact on the environment. The COVID-19 induced lockdown illustrated how excessive economic activity influences our environment detrimentally. About the effluents from the factories, the water in the Ganges has become potable. The Himalayas could be seen from the towns of Punjab- a sight that had not been possible for the last five decades.

For more than three-fourths of known economic history, India has been the dominant economic power globally. As research by Angus Maddison shows, till about 1750 AD, India accounted for more than one-third of the world's GDP. Economic dominance over such long periods manifests by design; not by mere chance. This year's Economic Survey establishes clearly that India dominated the global economy because our age-old traditions commended "ethical wealth creation" as a noble human pursuit. For instance, Kautilya's Arthashastra is a treatise on creating Artha, which is the Sanskrit word for wealth. Other Indian literature also recognises wealth creation as a worthy human pursuit. The Thirukural, a treatise

> The business models that Indian firms generate in catering to the needs of the poor can enable them to tap into markets in many under-developed economies in Asia and Africa. Therefore, by creating development models that cater to the needs of the poor consumers, a self-reliant India can help others and thereby occupy its rightful place as a global economic power.

on enriching human life by Tamil saint and philosopher Thiruvalluvar, asserts in verse 753 of Chapter 76: "Wealth, the large unfailing, speeds to every land; Dispersing darkness at its lord's command." Concisely, ancient Indian wisdom emphasises equally the means to creating wealth. Verse 754 in the Thirukural declares: "(Wealth) yields righteousness and joy, the wealth acquired capably without causing any harm." By appealing to the spiritual, moral and philosophical dimensions, Indian wisdom ensured that private greed does not wreak havoc on social good.

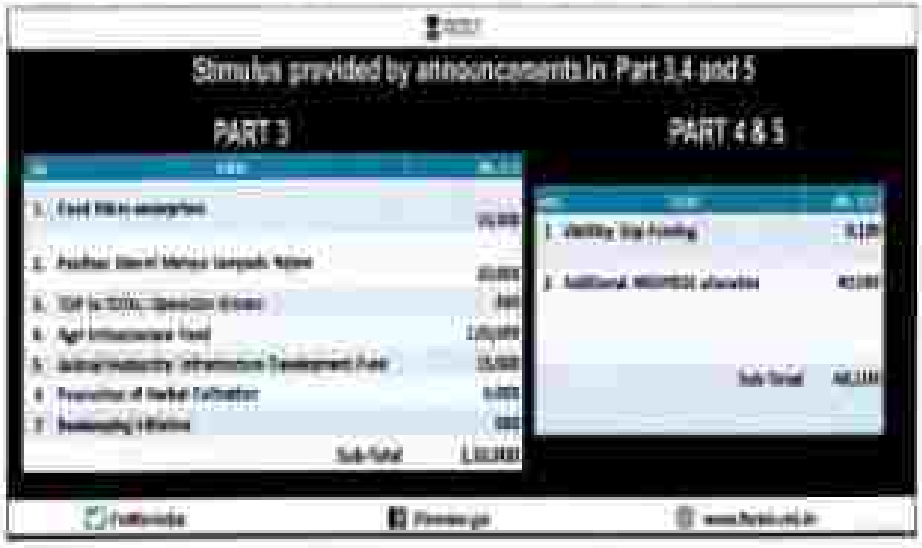
To ensure that economic development occurs without detrimentally impacting the planet, ethical wealth creation advocated in the Indian ethos now needs to become a global model for development. For that purpose, India needs to take the lead in exemplifying it domestically. Specifically, India needs to lead "frugal innovation" so that we use mother earth's resources as less as possible to maximise welfare for a large proportion of humanity. India should take a lead in this and thereby demonstrate the value of "frugal innovation" to the rest of the world.

Self-reliance Is Not Doing Everything Yourself

Whether it is an individual or a nation, self-reliance does not imply doing everything yourself. Similarly, building a self-reliant economy does not mean building an economy in isolation. Self-reliance implies recognising that when we depend on others for help, there will be times when such help will not be forthcoming. As the times we seek help may be the times when we are most vulnerable, self-reliance implies building the necessary capability to be independent at the most vulnerable times. Thus, self-reliance does not imply complacent self-sufficiency, where India cuts itself off from the rest of the world and thereby avoids competing with the best in the world and benchmarking itself against them. Instead, self-reliance requires delineating sectors that are strategically critical to the nation and investing in these sectors so that our dependence during vulnerable times is minimised.

Let us all work together for a self-reliant, resilient and a dynamic India which lends glory to our rich heritage.

The views expressed through this paper belong purely to author(s) and do not necessarily reflect the views of the organisations they belong to. ❑



References

1. Chapter 8, Economic Survey 2019-20 available at https://www.indiabudget.gov.in/budget2019-20/economicsurvey/doc/vol1chapter/echap08_vol1.pdf

Export Strategy

Dr Ajay Sahai

An effective exports promotion strategy hinges on robust and competitive domestic manufacturing. Manufacturing is competitive when it can compete with the best globally while simultaneously facing imports, particularly duty-free imports from our partners on the domestic turf.

The word "Aatmanirbhar" refers to both self-reliance and self-sufficiency. The former has a pragmatic positive connotation aimed at developing capabilities indigenously without shunning imports while the latter is impregnable, inward looking and has a negative denotation which hits at Ricardo's theory of "Comparative Advantage" which holds that international trade is a result of differences in the relative opportunity costs of countries in the production of different goods therefore even if a country is self-sufficient, it should still trade). The interpretation of any word or expression depends on the context in which it is being used. The Prime Minister used the phrase "Aatmanirbhar Bharat" while referring to the pandemic which has put a premium on self-reliance as essential supplies from source countries have been interrupted. COVID-19 has also disrupted the global supply chains and their new realignments are in the pipeline. India is again blessed with the opportunity to be a part of those supply chains where significant trade is still happening.

Though our domestic supply is currently not very efficient, it is reliable, and in this trade-off between reliability and efficiency, the former should get a preference over the latter. Such a calamity has taught us a lesson to not be excessively dependent on others for ensuring critical supplies, especially when the sources of such supplies are not fairly distributed. Even if domestic production is not the most efficient, we should encourage to provide it scalability to become competitive in the medium to long term. If we want to retain the tag of the 'Pharmacy of the World', we have to produce formulations and Active Pharmaceutical Ingredients (APIs) in our country. As demand may be limited initially, we must provide fiscal support to such manufacturers who may not be the most efficient, but who on achieving stability in production and scalability will be able to become competitive through economies of scale.

An effective exports promotion strategy hinges on robust and competitive domestic manufacturing. Manufacturing is competitive when it can compete with the best globally while simultaneously facing imports, particularly duty-free imports from our partners on the domestic turf. In "Wealth of Nations", Adam Smith argued that "the great object of mercantilism was to diminish as much as possible the importation of foreign goods for home consumption and to increase as much as possible the exportation of the produce of domestic industry." His theory is still relevant today particularly for countries having

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large internal markets. An export strategy aimed at import substitution and export promotion, as two sides of the same coin, is ideally suited for us.

Import substitution, unlike its general perception, is not undesirable. It is not inward looking in the sense of closing your door to imports, rather it is focused on developing domestic capability and prowess to reduce your dependence on imports, particularly when disruption of supply chains can deprive you of critical inputs/ products. Many countries constantly monitor the trends of imports and whenever they observe a sharp hike, they engage with the industry to understand the challenges faced in manufacturing such products domestically. Some countries have adopted an FDI-tariff linkage which enhances tariff for attracting FDI and encourages foreign suppliers to set up bases in their country to serve their consumers. I was talking to a surgical manufacturer, who exports products worth over USD 300 million to India but who hasn't set up base here; on inquiring about the reason behind the same, he responded that the import tariff in India is only 5 per cent, therefore he is more competitive while supplying from overseas to India. Had the import tariff been 25 per cent, he would have set up base in India. Such a hike in the tariff would have also encouraged Indian companies to venture into the manufacturing of these products by making domestic production more competitive than imports. While such decisions look plain and simple in retrospect, I am sure, policy makers would have taken a closer look at such options. Let us also not get swayed by the argument that other countries are not pursuing import substitution. How many countries have a market close to ours in terms of size? Import substitution requires that the market be of a certain minimum size to make manufacturing viable. Not many countries in the world possess such a market and hence they are unable to pursue an import substitution strategy.

Import substitution, unlike its general perception, is not undesirable. It is not inward looking in the sense of closing your door to imports, rather it is focused on developing domestic capability and prowess to reduce your dependence on imports, particularly when disruption of supply chains can deprive you of critical inputs/products.

It is not necessary to hike the import tariff to implement such a strategy. However, an ecosystem which provides a level-playing field must be offered to our manufacturers. This does not only mean granting them "deemed export" status but also involves extending concessional credit to such manufacturers along with competitive electricity tariff and efficient logistics. Currently, Indian manufacturers pay much more for inland freight, while supplying machinery from Southern India to Northern/Eastern India, than a foreign supplier dispatching it from Europe or North-East Asia; therefore, there is no level playing field. The tariff hike for imports substitution is warranted only to address the inverted duty structure or for a specific objective and it should have a definite sunset clause; such a clause is required so that companies scale up and get investment but don't become inefficient due to complacency. We also have to be vigilant of such tariffs as they can result in domestic cartelisation or monopolies which push prices up, thereby adversely impacting the upstream production. A positive environment to enable a supportive ecosystem for domestic manufacturers should be given preference over a tariff hike.

Indian exports have progressively diversified in terms of products and the share of developing and emerging economies as destinations of Indian exports has significantly increased over time. However, the evolution of our exports has not followed a classical pattern. The trends point to a contradiction in the Indian economy – a technologically advanced services sector exporting high technology services and a lagging manufacturing sector exporting relatively low-value products; our export profile requires a major transformation. We are largely focused on exports of textiles, leather, handicraft, gems & jewelry, carpets, marine and agro products. While these are important for employment

creation, their share in global exports is on a decline. The top 5 products in global exports, accounting for over 50 per cent of the trade are- electrical and electronics products, petroleum goods, machinery, automobile and plastic goods. However, the share of these products in our exports is less than 33 per cent. Our global share in these 5 products, put together, is a little over 1 per cent though our share in overall global exports stood at 1.7 per cent in 2019.

A related issue is the low share of India in high technology exports. High technology exports account for 6.3 per cent of our aggregate exports while this proportion stands at 29 per cent for China, 32 per cent for South Korea, 34 per cent for Vietnam and 39 per cent for Singapore. (In absolute terms, India exported high technology goods worth USD 20 billion, Malaysia USD 90 billion, Singapore USD 155 billion, South Korea USD 192 billion and China USD 652 billion). The recent initiatives taken to encourage manufacturing of electronics, diagnostic and surgical equipment along with the efforts to attract global FDI will help in correcting this.

We need to focus on R&D and product innovation to give impetus to our export promotion strategy and to survive in a dynamic and transformational market. It is ironic that though over 300 out of 500 Fortune 500 companies have their R&D base in India, we are amongst the lowest spenders on R&D. Unfortunately, the fiscal support to R&D in the form of tax deductions has been lowered in the last few years. The Government should revisit the issue and provide liberal tax deductions on R&D as it is associated with a long gestation period and significant risks; such deductions would encourage investment, particularly by small and medium units.

China's image as a supplier has taken a hit, specifically in edible products due to the outbreak of COVID-19. This presents a huge opportunity to India in the export of fruits, vegetables, cereals, tea and marine products. However, the export of many of the agricultural commodities is currently unviable due to the ruling Minimum Support Price (MSP) which at times is much more than the international prices. While MSP has a wider objective, the fundamentals of exports cannot be ignored as no individual will export at a loss. The Government should provide some mechanism to reimburse the differential price (MSP less the international price) to exporters. Such a mechanism will help exporters aggressively compete in global markets besides ensuring continuity of supply. We have experience in operating such schemes known as International Price Reimbursement Scheme for the engineering sector. The same 'mantra mutandis' can work very

well for commodity exports. The freight disadvantage has been largely nullified through the new Transport and Marketing Scheme for agri products but the same should be set for a minimum period of 3 years, rather than extending it on yearly basis as the yearly nature of the scheme hinders exporters from focusing in the benefits of such schemes while planning for the long-term.

The path-breaking reforms in agriculture would push agricultural exports. Relaxation in the Essential Commodities Act will encourage exporters to procure such products and build inventory without the threat of hoarding. Removal of restriction on inter-state movement will ensure efficient, transparent and seamless inter-state movement of farmers' produce resulting in remunerative prices. In the initial system, farmers were forced to sell through mandis while purchasers were free to sell to anyone. Now, farmers can engage with agri processors, exporters and even large retailers, particularly those which provide specialised platforms for procurers and consequently for the sale of farm produce at mutually agreed upon prices. Such platforms will also help farmers get information about phyto-sanitary standards (in terms of the usage of pesticides, insecticides and fertilisers) which is vital for gaining market access to advanced economies.

The revised definition of MSME will also encourage exports by these companies as the government has excluded exports turnover from the aggregate turnover for eligibility purposes resulting in more companies qualifying for MSME status. Moreover, the increased limit on investment in plant and equipment for medium companies, from Rs. 10 crore to Rs. 50 crore, will encourage adoption of more advanced technology in manufacturing which is the key to competitiveness in exports.

More than 50 per cent of the global trade happens through inter-regional value chains and includes countries from several regions. Unfortunately, India is not a part of such value chains except in case of automobiles and gems & jewelry. The late joining of the FTAs, cumbersome customs processes and high logistics cost have contributed to this anomaly. An efficient trade facilitation can integrate into the regional value chain and subsequently into the global value chain for pushing the exports. It is good that trade facilitation, reduction in logistics cost and constructive engagement with our trade partners is high on the agenda of the government.

Greater focus should also be given to FDI to boost exports and enhance productivity. Numerous initiatives have been taken for liberalising the FDI regime in recent years, yet FDI inflows have not picked up substantially. We should improve the business environment and expedite regulatory and other clearances in all levels to translate greater liberalisation into higher inflows. FDI not only brings capital but more importantly access to technology and markets which are key to exports. However, FDI in exports should be supplemented by concluding FTA/ CECA/CEPA with our trade partners. We hope that COVID-19 will hasten the process of early conclusion of India-EU Broad-based Trade & Investment Agreement (BTIA) and Free Trade Agreement (FTA) with Australia and New Zealand besides bilateral trade agreement with USA. Vietnam has played its card very well in working out such arrangements with the EU; by having FTA with both EU and China, it can attract investment which is moving out of China at the time of this pandemic while still allowing them to cater to both markets.

While we are doing extremely well in IT and ITES, we are much below our potential in tourism, financial services and transport services. In the IT sector also, we need to diversify from advanced economies to emerging countries and move up

the value chain as we are largely at the low end of the IT segment right now. Currently, we spend much more on outbound tourism than what we collect from inbound tourism. A country the size of India earns only about USD 30 billion through tourism which is a little over 1 per cent of our GDP. We can easily take it to USD 100 billion by 2025 despite the subdued trend in 2020. Similarly, we spent over USD 65 billion on overseas freight while we collected only USD 19 billion as freight services. Strengthening the Shipping Corporation of India and bringing in private players can easily increase our earnings to USD 30 billion by 2025. Our financial services earnings which stood at USD 5.5 billion in 2018 can easily be taken up to USD 15 billion by 2025. To promote growth of accounting and financial services, we should allow FDI in the domestic accounting and auditing sector, introduce a transparent regulatory framework, and ease restrictions on the client base in the accounting and auditing sector. For the education sector, let us allow foreign universities to set up campuses in India, provide easy visa regimes for students and education service providers, remove regulatory bottlenecks, provide recognition to online degrees and set up appropriate evaluation techniques for online courses. To push motion and audio-visual services, we require measures like introduction of insurance in the film industry, promotion of private investments in film schools, exploration of franchisee business models to exploit film franchises and promotion of value chains in the gaming industry value. COVID-19 will bring focus to digitisation and thus will provide a huge opportunity to us in networking services, telemedicine and animation & gaming.

We need to focus on R&D and product innovation to give impetus to our export promotion strategy and to survive in a dynamic and transformational market. It is ironic that though over 300 out of 500 Fortune 500 companies have their R&D base in India, we are amongst the lowest spenders on R&D.

Adam Smith argued that if a certain trade was unprofitable for private merchants, it was unlikely that it would be profitable for the nation. In line with the same, the government and exporters should work in tandem to impart profitability to exports. Whenever the government has provided a cushion to exports through some flexible schemes, our exports have zoomed. The rise in exports in the past is largely attributable to schemes like Value Based Advance License, Duty Entitlement Passbook, Target Plus and Status Holder Incentive Schemes. Though, these schemes were also in the news for certain misuse, their beneficial effect on exports outweigh such misuse as they did fulfill the basic intended objective of increasing our exports. The current status of India under the WTO subsidy discipline does not grant any leeway to introduce such schemes, however concerted efforts should be made to provide fiscal and non-fiscal relief which cuts down on export costs and adds to profitability.

Exports have to be treated as a 'National Priority' and all stakeholders (central and state governments, regulatory and promotional agencies, service providers and entrepreneurs) need to be on the same page to facilitate exports. An institutional set-up to address the problems and challenges faced by exports in the shortest time frame possible is the need of the hour. A three-tier structure with the district, state and central level working on an electronic platform would be ideal and the officers attending such meetings should be empowered to take quick decisions. Despite a thriving domestic market, exports are an important and integral part of our economy. All those years in which the economy grew by 8 per cent or more were the years in which exports grew over 15 per cent. Therefore, a rebound in exports during the post COVID-19 period is essential for a revival of the domestic economy. A resilient exports sector has successfully done so in the past and with the support of an enabling and supportive ecosystem, it can certainly deliver now as well. ❑

JAM Trinity

Ankita Sharma
Hindol Sengupta

The Government has been actively promoting the use of digital technology and establishing nationwide online platforms to boost policy implementation, essential operations and transparency during COVID-19 crisis. Aarogya Setu has proved to be an invaluable tool in the fight against the pandemic and the JAM trinity is acting as a safety net and helping millions who need immediate monetary aid.

Technology as a tool of governance had already transformed many areas in the delivery of public good in India even before the COVID-19 pandemic. The disease propelled a test of the digital mechanisms of response in a moment of crisis.

There have been, in essence, two main pillars of the use of digital technology in the pandemic- monitoring, and delivery of public goods. Monitoring has been made possible by the Aarogya Setu mobile app which has broken records of swift volume downloads of an app globally.

By assisting in the recording, enumeration, and location-tracking of COVID-19, Aarogya Setu has proved to be an invaluable tool in the fight against the pandemic- an example of the use of tech in governance which other countries have adopted. The declaration that the data on the app would be stored only for a limited period has strengthened its security dimension.

The use of the JAM trinity (Jan Dhan bank account for the underprivileged-Aadhaar number-Mobile telephony), which has been the cornerstone of the Prime Minister's attempt to embrace technology in governance at a mass scale has also now gone through its toughest test yet. The promise of easy identification and transfer of government benefits and funds has been tested against the need for rapid delivery during the pandemic.

India has more than 38 crore (380 million) Jan Dhan bank accounts which have been used to transfer government benefits to around 590 million people in 2018-19 serving more than Rs. 51,000 crores (Rs. 1.41 trillion). Around Rs. 7.23 trillion has been transferred in government subsidies directly to bank accounts since 2014-15.

More than 1 billion Aadhaar numbers have been issued covering more than 99% of all Indians. In 2019, the number of smartphone users in India crossed 500 million. The JAM trinity is also the 'enabler' for the country's Direct Benefit Transfer programme (DBT) which uses an electronic method to streamline delivery of cash transfers under government welfare schemes. As the PM said, "This seemingly simple connection has not only stopped corruption that was going on for decades, but has also enabled the government to transfer money at the click of a button. This click of a button has replaced multiple levels of hierarchies on the file and also weeks of delay."

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Why the Jan Dhan-Aadhaar-Mobile (JAM) Trinity is so Powerful?

Introduced in the first term of this Government, the Jan Dhan scheme is proving to be a boon for millions of Indians seeking financial assistance during the ongoing countrywide COVID-19 lockdown. Its strong interlinkage with the mobile linked Aadhaar scheme has facilitated swift transfer of money into bank accounts of beneficiaries without pilferage or corruption.

In the words of the Prime Minister, "This infrastructure has helped us tremendously in transferring money directly and immediately to the poor and needy, benefiting crores of families, during the COVID-19 situation."

With the lockdown placing immense strain on the household budgets of several sections of society, the JAM trinity is acting as a safety net and helping millions who need immediate monetary aid. Following are the key benefits that highlight JAM as an imperative in the current times:

- The JAM trinity has given a boost to the DBT programme and expanded its coverage from partial to ubiquitous. Aadhaar has facilitated legitimate databases while Jan Dhan has offered bank accounts for all.
- By eliminating the need for middlemen or conduits, JAM has helped minimise avenues of corruption, irregularities, wrong-doings and pilferages. It has also therefore, promoted the ease of doing business.
- Given the need for physical distancing to curtail the spread of COVID-19, JAM is promoting online transactions among the beneficiaries, use of ATMs and payment cards instead of physical visits to the banks.

- In the longer run, DBT schemes like JAM will make the rural population get acquainted with the concept of 'saving' thus contributing to the GDP of the country as a whole.

The use of the JAM trinity (Jan Dhan bank account for the underprivileged-Aadhaar number-Mobile telephony) has now gone through its toughest test yet. The promise of easy identification and transfer of government benefits and funds has been tested against the need for rapid delivery during the pandemic.

In a recent statement the Finance Ministry said, "A digital pipeline has been laid through linking of Jan-Dhan accounts as well as other accounts with the account holders' mobile numbers and Aadhaar [Jan Dhan-Aadhaar-Mobile (JAM)]. This infrastructure pipeline is providing the necessary backbone for DBT flows, adoption of social security/ pension schemes, etc."

Digital Technology in Governance

Since 2014, the government has been actively promoting the use of digital technology and establishing nationwide online platforms to boost

policy implementation, essential operations and transparency. Platforms like Aarogya Setu and MyGov have been widely appreciated, embraced and used by millions of Indians today. As a result, critical COVID-19 related information dissemination, especially treatment protocols and healthcare services are being enabled largely online on digital multimedia.

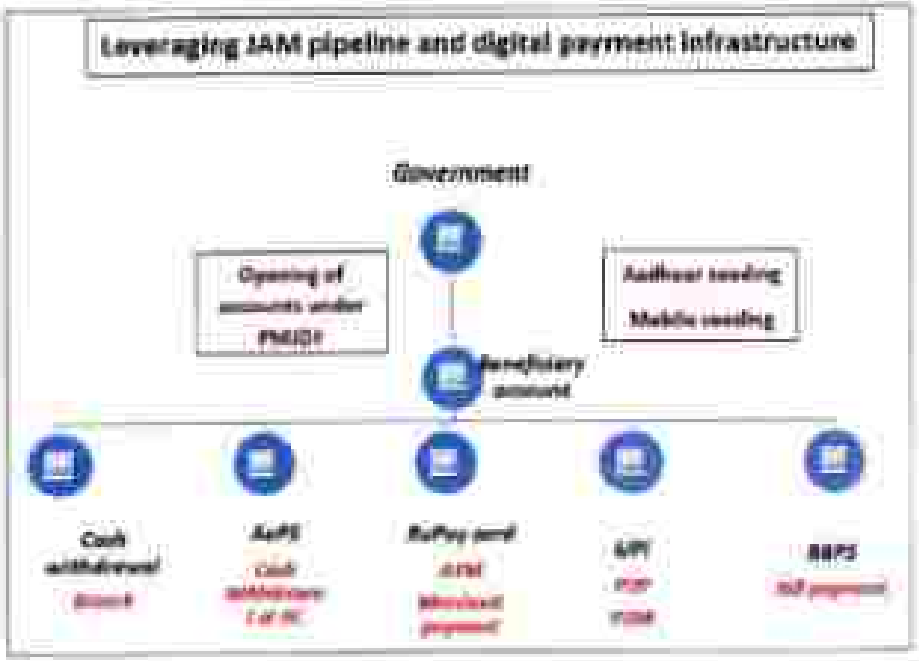
Social media and online platforms have emerged during this crisis as key conduits that connect citizens with governments and allow all users to access the most credible information. These are truly powerful interfaces, amid the lockdown, that connect all people remotely and with minimal cost. More importantly, technology is not only fueling healthcare and emergency medical services but also alleviating the pressures placed on the supply chains and public distribution networks. "Embracing digital payments is a prime example of adaptability. Shop owners, big and small, should invest in digital tools that keep commerce connected, especially in times of crisis. However, this is not an easy thing to accomplish given India's massive population, gigantic size, economic disparities of citizens and huge scale of operations. Consider this: Indian government directly supports nearly 130 million beneficiaries through public welfare schemes.

Jan Dhan scheme is proving to be a boon for millions of Indians seeking financial assistance during the ongoing countrywide COVID-19 lockdown. Its strong interlinkage with the mobile linked Aadhaar scheme has facilitated swift transfer of money into bank accounts of beneficiaries without pilferage or corruption.

To address this, digital safeguards are playing a key role. For instance, the Aadhaar scheme, which provides all Indian citizens with a unique and verifiable digital identity, enables beneficiaries to avail services and benefits entitled to them without hassle. This includes the Jan Dhan accounts which take banking to the most impoverished and marginalised consumers eliminating the need for unnecessary paperwork thereby helping the government reduce costs and enhancing its efficiency.

Digitalisation has also helped in the monitoring and evaluation of schemes while plugging loopholes. As PM states, "After all, the most transformational impact of technology often happens in the lives of the poor. It is technology that demolishes bureaucratic hierarchies, eliminates middlemen and accelerates welfare measures."

The use of technology to monitor the COVID-19 has been rolled out not only across the country (through Aarogya Setu [available in 11 languages] but also at the state level through a host of apps including in Punjab (Cova Punjab), in Himachal Pradesh (Corona Mukt Himachal), Uttarakhand (Uttarakhand Covid-19 Tracking System), Chhattisgarh (Raksha Sarv; in collaboration with the start-up Mobcoder), Gujarat (SMC Covid-19 Tracker), Maharashtra (Mahakavach), Goa (Test Yourself Goa; with Innovaccer, and COVID Locator), Odisha (Odisha Covid Dashboard), Puducherry (Test Yourself Puducherry), Tamil Nadu (COVID-19 Quarantine Monitor), Karnataka (Corona Watch), Kerala (GoK Direct-Kerala). Other uses of technology include the 1921 telephone service of the National Informatics Centre to run surveys on the prevalence of disease, the Department of Personnel and Training's iGOT for training frontline workers against COVID-19 on the Ministry of Human Resource Development's DIKSHA platform, and live broadcast of lessons for central-government-run Kendriya Vidyalaya schools using the SWAYAM platform.



Relief and Reforms to Fight COVID-19

A robust digital payments infrastructure has enabled cash transfer of Rs. 28,256 crore to more

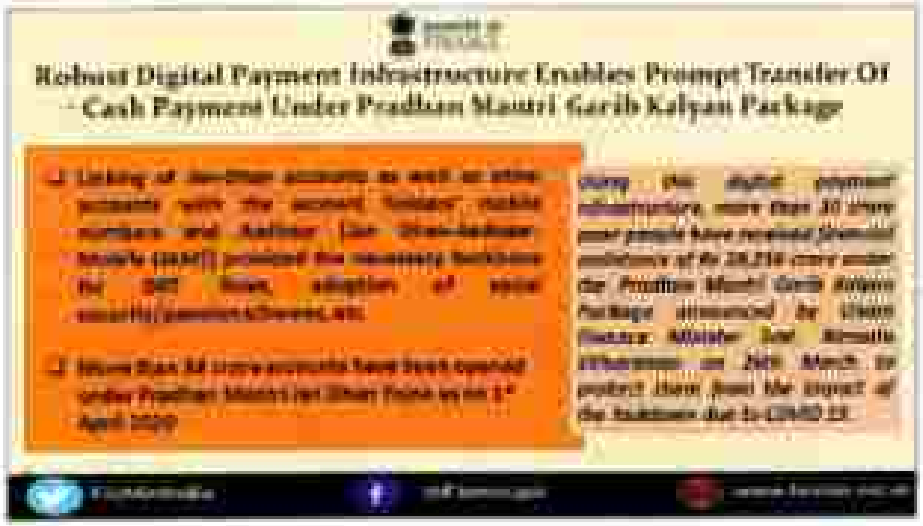
than 31 crore beneficiaries under the financial assistance scheme Pradhan Mantri Garib Kalyan Yojana (PMGKY).

- Finance minister Nirmala Sitharaman had last month announced Rs. 1.7 trillion financial assistance package, including cash transfer for the poor to help them battle the impact of the outbreak of COVID-19.
- 6.93 crore farmers were benefited through the Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) to help farmers tide over the COVID-19 crisis. Under the scheme, the government transfers Rs. 2,000 each directly to the farmers' bank accounts through direct benefit transfer (DBT). "Rs 13,855 crore have gone towards payment of first instalment of PM-KISAN", the finance ministry said.
- 19.86 crore women Jan Dhan account holders received Rs. 500 each in their account. The total disbursement under the head was 9,930 crore.
- Rs. 1,400 crore disbursed to about 2.82 crore old age person, widow and disabled people under the National Social Assistance Programme (NSAP). Each beneficiary received an ex-gratia cash of Rs. 1,000 under the scheme.
- 2.16 crore construction workers received financial support from the Building and Construction Workers' Fund managed by state governments. Under this Rs. 3,066 crore were given to beneficiaries.
- The government is providing free LPG refills for the next three months to over 8.3 crore poor women under the Ujjawala scheme and Rs. 50 lakh insurance cover for healthcare workers.
- The government has disbursed the first instalment of Rs. 15,841 crore to 7.92 crore farmers under the PM-KISAN scheme, since March 24, the day the lockdown was announced to curb the spread of COVID-19.

Platforms like Aarogya Setu and MyGov have been widely appreciated, endorsed and used by millions of Indians today. As a result, critical COVID-19 related information dissemination, especially treatment protocols and healthcare services are being enabled largely online on digital multimedia.

Global Recognition for the Efficacy of the JAM Platform

The Center for Global Development has noted that the JAM trinity enables the Indian government to make payments "more effectively and inclusively."[1] The centre has created a JAM Index based on Findex data (which tracks how adults save, borrow, make payments, and manage risk) to rank countries on their use of ID systems, mobile phones, and financial accounts to effectively make government payments. India and Kenya are two top ranking



countries in this index. It notes that, "Cash-based social assistance can be delivered most efficiently and timely when the percentage of the population that has access to the three components—IDs, phones, and financial accounts—is high, systems are well-integrated, the existing system of benefits and transfers has wide coverage, and benefits are paid through financial accounts linked to the ID."[4]

Conclusion

Not just the deployment but even the adoption of the digital technology as a counter to the Novel Coronavirus in India has been at record levels—the Aarogya Setu app, for instance, reached 100 million users.[5]

As the Prime Minister has said, "India has perhaps the largest such infrastructure in the world. This infrastructure has helped us tremendously in transferring money directly and immediately to the poor and needy, benefiting crores of families, during the COVID-19 situation."[6] ❑

Endnotes

1. Covid-19: 'Digital payment infra helps cash transfer to over 20 crore poor under PMGKY', The Hindu, April 12, 2020 https://www.thehindubusinessline.com/economy/policy/covid-19-digital-payment-infra-helps-cash-transfer-to-over-20-crore-poor-under-pmgkp/article31324803.ece
2. The Center for Global Development is a not-for-profit think tank based at Washington DC.
3. https://www.cgdev.org/blog/covid-19-how-countries-can-use-digital-payments-better-quicker-cash-transfers
4. https://www.cgdev.org/blog/covid-19-how-countries-can-use-digital-payments-better-quicker-cash-transfers
5. https://www.timesnownews.com/technology-science/article/aarogya-setu-mobile-app-hits-another-milestone-touches-100-million-downloads-in-india/591996
6. https://www.linkedin.com/pulse/life-era-covid-19-narendra-modi/

Making Farmers Self-Reliant

Dr Jagdeep Saxena

Concerned with the plight of farmers, the Government of India made a clarion call for doubling farmers' income by 2022 and devised a sound roadmap to achieve the target. Reforms were initiated along several verticals ranging from crop and livestock insurance, income support schemes, easy credit flow, promotion of agripreneurship to agriculture marketing and organising farmers in business groups.

On the front of agriculture and food production, India is a self-reliant nation having a record output of cereals, fruits, vegetables and highest production of milk in the world. Further, India is maintaining a sustainable food security despite steady increase in population and rising living standard of people that triggers greater demand of diverse food items. But farmers, the drivers of self-reliance, remained at the edge struggling with low income, diminishing profitability and risk-laden livelihood. Concerned with the plight of farmers, the Government of India made a clarion call for doubling farmers' income by 2022 and devised a sound roadmap to achieve the target. Reforms were initiated along several verticals ranging from crop and livestock insurance, income support schemes, easy credit flow, promotion of agripreneurship to agriculture marketing and organising farmers in business groups.

Mitigating Risks, Securing Livelihood

Steady surge in extreme weather events and vagaries of monsoon made Indian farming vulnerable to frequent crop failures that initiated large-scale migration of farmers to non-farming sectors. In order to mitigate risk and regain reliance in agriculture sector, the Government of India launched a comprehensive crop insurance scheme in 2016 that provides coverage from pre-sowing to post-harvest against natural

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non-preventable risks. 'Pradhan Mantri Fasal Bima Yojana (PMFBY)' is a low premium policy in which farmers are required to pay only 2%, 1.5% and 5% of the sum insured for kharif, rabi and commercial/ horticultural crops respectively. Balance premium is paid upfront and shared equally between Central and State Governments. Not only farmers, but tenant farmers and sharecroppers engaged in cultivation of notified crops are eligible for crop insurance policy. Since its inception, in first three years, farmers paid Rs. 13,000 crore as premium whereas claims worth over Rs. 60,000 crore were claimed and paid to farmers. Even during recent lockdown period scheme functioned smoothly making payment of claims worth over Rs. 6,400 crore. To make the scheme more effective and attractive to farmers, the Government has comprehensively revised the operational guidelines making provision for payment of 12% interest per annum to farmers if claims are not settled within 10 days of prescribed time-limit. A new provision also envisages add-on coverage for damage by wild animals on pilot basis. New and smart technologies are helping insurance companies to assess crop loss quickly and expedite payment of claims.

Based on the increasing awareness of farmers and rising popularity, the scheme envisages increase in coverage from the existing 23% to 50% of Gross Cropped Area in the country. Meanwhile, success stories of declining rural migration are pouring in, especially from the vulnerable regions of the country. The scheme has grown into multi-stakeholders entity with pan-India presence engaging Central Government, 27 State Governments, 18 empanelled insurance companies, 340 banks and 45,000 active common service centers.

'Pradhan Mantri Fasal Bima Yojana (PMFBY)' is a low premium policy in which farmers are required to pay only 2%, 1.5% and 5% of the sum insured for kharif, rabi and commercial/ horticultural crops respectively. Balance premium is paid upfront and shared equally between Central and State Governments. Not only farmers, but tenant farmers and sharecroppers engaged in cultivation of notified crops are eligible for crop insurance policy.

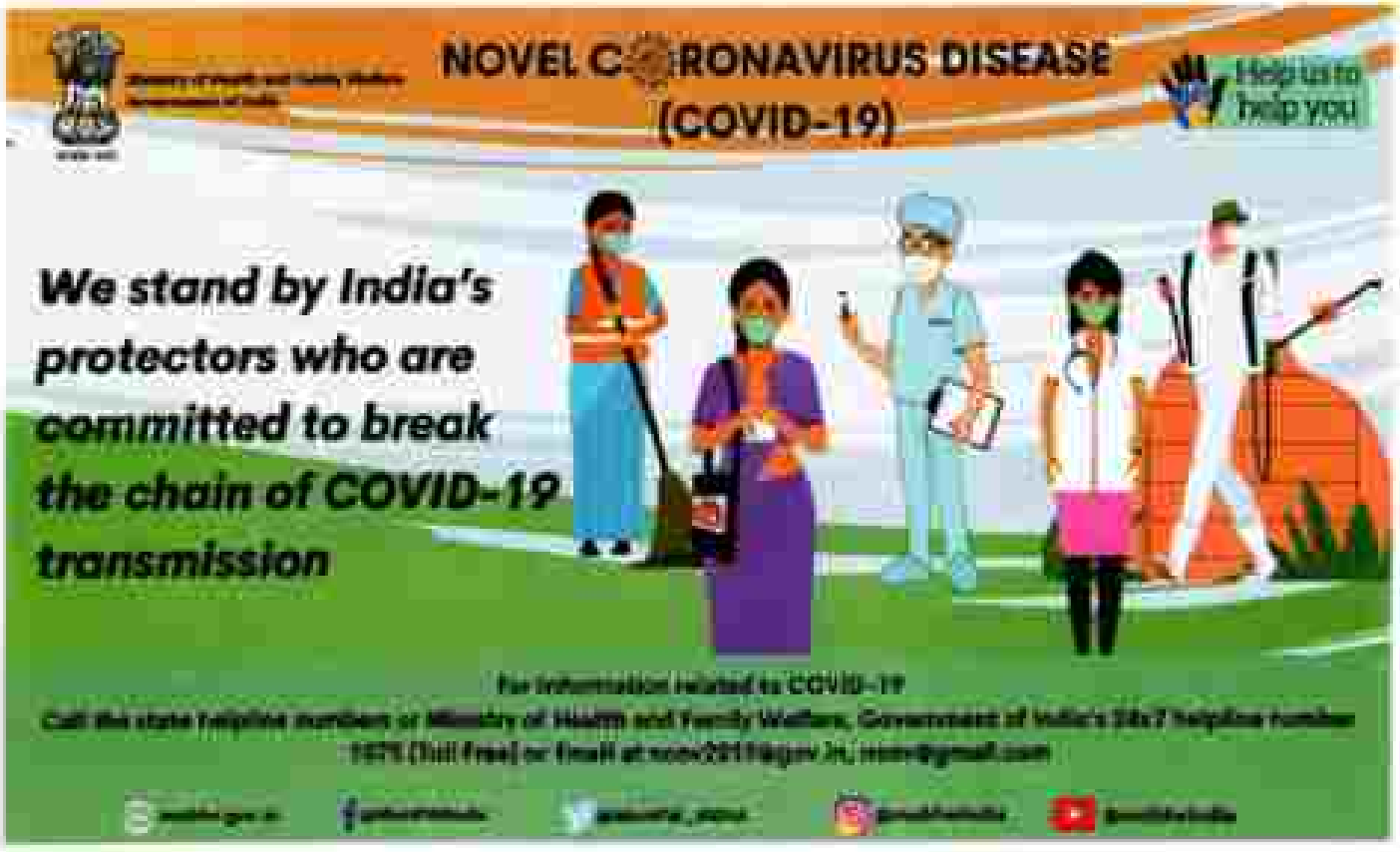
Small, fragmented and dispersed landholdings are recognised as one of the major impediment in increasing farmers' income. Nearly 85% of such land holdings belong to small and marginal farmers, who being unorganised, are unable to realise good value for their produce. Small producers do not have the volume individually (both inputs and produce) to get the benefit of economies of scale. To address this specific concern, the government started organising them into Farmer Producer Organisations (FPOs) who have better bargaining power vis-à-vis the bulk suppliers of produce and bulk buyers of inputs. NABARD, Small Farmers' Agribusiness Consortium (SFAC), government departments, corporates, national and international agencies are providing financial and technical support in their business activities. Hand-holding during initial phase helps FPOs to survive, sustain and become self-reliant in due course. A large number of FPOs are making waves across the country motivating workers even in non-farming sector to organise themselves into Producer Organisations.

During initial phase (2014-15), the government created a special PRODUCE (Producers Organisation Development and Upliftment Corpus) Fund with a corpus of Rs. 200 crore in NABARD for the promotion of 2,000 FPOs in the country. But the major impetus was given in the Union Budget 2019-20 by making budgetary provision for formation of 10,000 new FPOs over the next five years. A total sum of Rs. 4,496 crore was allocated for five years (2019-20 to 2023-24) with a further committed liability of Rs. 2,369 crore for the period 2024-25 to 2027-28 towards hand-holding of each FPO for five years. This was in addition to currently existing around 6,000 FPOs in the country.

Success stories reveal that FPOs have ensured benefits to the small and marginal farmers through economies of scale, improved market reach, improved access to extension services and reduction in transaction costs. Taking a cue, National Rural Livelihood Mission (under Deendayal Antyodaya Yojana) has initiated organising small and marginal women farmers into producer groups to increase market access and value addition of farm produce.

Procurement and Support

In a major move towards self-reliance of farmers, the Government accepted and implemented the recommendation to hike Minimum Support Prices (MSPs) at levels of one and half times of the cost of production (2018-19). Accordingly, the Government increased MSPs of all mandated kharif, rabi and other commercial crops with a return of 1.5 times over all India weighted average cost of production for the season 2018-19. Elaborate and effective arrangements are in place for maximum procurement of produce by government agencies at MSP. Procurement is backed by a mechanism that ensures purchase at MSP even if the price of the agricultural produce falls below the MSP in open market. Recently, MSP



of 14 kharif crops were increased to the rate of 50% to 83% for the season 2020-21. Under new MSP regime, the expected returns to farmers over their cost of production maximum for pearl millet (85%), followed by urad (83%), tur (58%) and maize (53%). For rest of the crops, it is usual 50% return over the cost of production.

Taking note of large scale indebtedness of farmers, a unique and innovative Kisan Credit Card (KCC) scheme was launched to provide institutional credit to farmers to meet their various needs related to farming. It is a liberal scheme that supports small and marginal farmers, share croppers, oral lessees and tenant farmers as well. Recently, to expand the beneficiary base of KCC, the Government has waived processing fee, inspection, ledger folio charges and other service charges for short term crop loans up to Rs. 3 lakh. Interest subvention is also provided on such loans for a period of one year in case of timely repayment. Interest rate of 7% per annum gets reduced to 4% in such cases. Under a special drive, all PM-Kisan beneficiaries have been brought under the ambit of KCC and a flexible limit of Rs. 10,000 to Rs. 50,000 is provided to marginal farmers based on the land holdings and their credit needs. Realising the need, facility of KCC was extended to dairy farmer and fishers, and recently under 'Atmanirbhar Bharat Package' a special drive is launched to provide KCC to 1.5 crore dairy farmers associated with milk unions and milk producing companies within two months (1st June-31st July, 2020). This special package also aims to cover 2.5 crore new farmers under the KCC scheme.

> **Small, fragmented and dispersed landholdings are recognised as one of the major impediment in increasing farmers' income. Nearly 85% of such land holdings belong to small and marginal farmers, who being unorganised, are unable to realise good value for their produce. Small producers do not have the volume individually to get the benefit of economies of scale.**

To fund various credit schemes, the Government is steadily increasing the volume of institutional credit, which was Rs. 8.5 lakh crore in 2014-15, but now stands at Rs. 15 lakh crore in the financial year 2020-21. To further stabilise the economic status of farmers, a special income support scheme was launched (effective from 1st December, 2018) that provides Rs. 6000 per year in three equal instalments of Rs. 2000 each every four months. Pradhan Mantri Kisan Samman Nidhi (PM-Kisan) is an initiative by the Government of India that provides income support to all farmer families across the country. The relevant amount is transferred directly to bank accounts of farmers.

Trade and Marketing

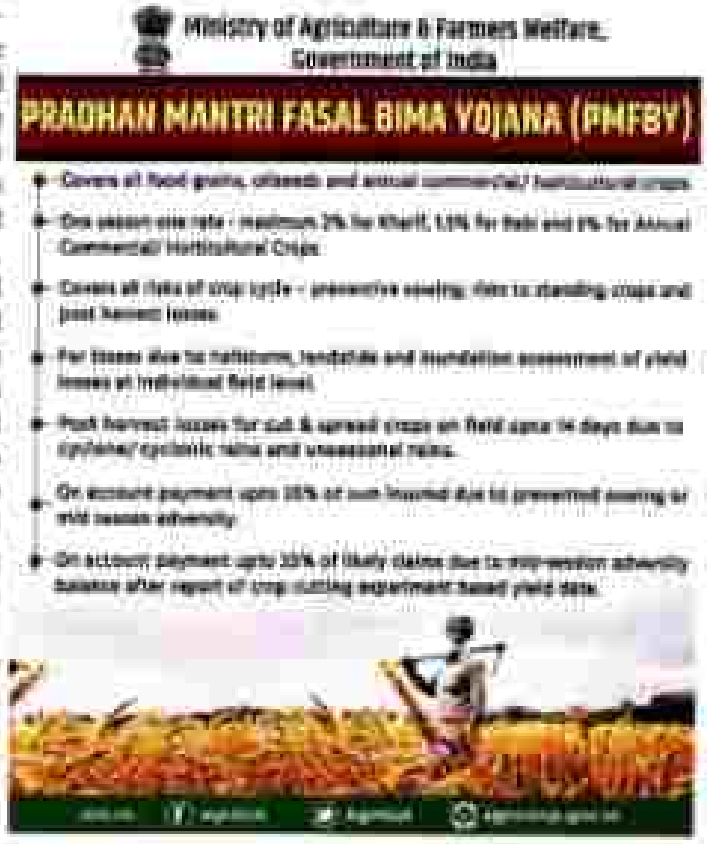
Being a key area, the Government of India initiated a comprehensive reform programme in agriculture marketing and trade sector to ensure better returns to farmers, especially to small and marginal ones who do not have large volumes to sell. Such farmers easily fall prey to middlemen or brokers and loose a large sum as transaction cost. Taking a major step, a unique pan-India electronic trading portal was launched for business and marketing of agricultural commodities in India on 14th April, 2016.

Popularly called eNAM (Electronic National Agriculture Market), this digital initiative aims to integrate existing agricultural mandis on an online platform to realise the vision of 'One Nation, One Market'. With adequate technical backstopping, 585 mandis were integrated in Phase-I and 415 mandis in Phase-II, thus the platform now has

a total number of 1000 mandis across 18 States and three Union Territories. Over the last four years, eNAM has made a spectacular headway with over 150 commodities (foodgrains, oilseeds, fibres, fruits, vegetables etc.) being traded on the platform, and has crossed a record business milestone worth Rs. 1 lakh crore. Currently, 1.66 crore farmers, 1.31 lakh traders, over 73,000 commission agents and over 1,000 FPOs are on board.

During COVID-19 lockdown crisis, three new modules of eNAM were launched to facilitate farmers. eNAM enables FPOs to conduct trade of commodities from their own collection centres declared as 'Deemed Market' or 'Sub Market Yards'. Similarly, another module facilitated warehouses for Electronic Negotiable Warehouse Receipts (eNWRs) trading. Some of the States have now declared warehouses as deemed market and sub-market yards to support warehouse based trade. Recently included logistics module facilitates transportation of commodities from farm to mandis, and from mandis to warehouses or consumption centres.

India produces a wide variety of food items that can be exported to selected nations for enhanced returns to farmers. But the potential remains untapped due to various trade policies that proved detrimental to global trade of agricultural produces. During 2018-19, India could export agri-products worth Rs. 2.7 lakh crore, whereas imports touched value of Rs. 1.77 lakh crore.



The Government has recently initiated a comprehensive 'Agriculture Export Policy' aimed at doubling agricultural exports and integrating Indian farmers and agricultural products with the global value chains. To promote and facilitate export of Indian agri-produce to new destinations, it has created agri-cells in many Indian embassies abroad that take care of agricultural trade related issues. Export of all varieties of pulses and edible oils (except mustard oil) has been allowed to ensure the greater choice in marketing as well as the better remuneration for farmers' produce. However, import duties have been raised and provision of 'Minimum Import Price' (MIP) was imposed on selected commodities to protect the domestic growers and their livelihood from cheap import of the commodity.

Building Infrastructure, Creating Value Chains

In the recently announced 'Aatmanirbhar Bharat Package', a major emphasis was laid on development of infrastructure in agriculture sector due to its proven potential for increasing self-reliance in farmers, an agri-infrastructure fund of Rs. 1 lakh crore will provide finance to Primary Agricultural Co-operative Societies (PACS), FPOs,

agri-preneurs, agri-startups etc. to develop farm-gate infrastructure for farmers. Another Rs. 10,000 crore scheme will support micro-food enterprises, FPOs, SHGs, Co-operatives etc. that need technical upgradation to qualify for FSSAI food standards, build brands and marketing network.

A cluster-based approach in aspirational districts will be promoted to realise the vision of 'Vocal for Local with Global Outreach'. For example, Mango in Uttar Pradesh and Orange in Maharashtra will get a fillip in trade, benefitting a large number of associated farmers. Under Pradhan Mantri Matsya Sampada Yojana, Rs. 20,000 crore has been allocated, of which Rs. 9,000 crore is exclusively dedicated towards infrastructure development such as fishing harbours, cold chain, markets, new fishing vessels etc. More valued productions, such as cage culture, seaweed farming, ornamental fisheries, will be supported for increasing income of fishers substantially. This initiative is expected to generate employment for over 55 lakh persons and double the exports to Rs. 1 lakh crore.

On the similar pattern, an Animal Husbandry Infrastructure Development Fund of Rs. 15,000 crore is being created to support private investment in dairy processing, value addition and cattle feed infrastructure. In food processing sector, 'Pradhan Mantri Kisan Sampada Yojana' is already financing and supporting development of mega food parks, integrated cold chains and infrastructure for agro-processing and value addition. The scheme has successfully linked a large number of farmers and food processors to domestic and international markets. In operation since 2016, the Rs. 6,000 crore scheme is expected to benefit 20 lakh farmers during 2016-20.

A unique and innovative Kisan Credit Card (KCC) scheme was launched to provide institutional credit to farmers to meet their various needs related to farming. It is a liberal scheme that supports small and marginal farmers, share croppers, oral lessees and tenant farmers as well.

In the 'Aatmanirbhar Bharat Package', special allocations have been made to support farmers in allied activities that have proven track record. With an outlay of Rs. 4,000 crore, herbal cultivation will be promoted for next two years covering an area of 10 lakh hectare. The initiative expects to generate Rs. 5,000 crore income generation for farmers. Beekeeping will be supported with a fund of Rs. 500 crore for infrastructure development related to marketing, storage, post-harvest and value addition facilities. The new fund will lead to increase in income for two lakh beekeepers with better prospects of quality honey to consumers.

In addition to centrally sponsored schemes, various state governments have also launched special welfare schemes for farmers to augment their income. The 'KALIA' scheme of Odisha, Mukhya Mantri Krishi Ashirwad Yojana of Jharkhand and Rythu Bandhu of Telangana are some of the noted schemes that have shown positive impact on income and livelihood of farmers. New ways have been paved for making farmers 'aatmanirbhar' to develop a new, resilient and self-reliant India.

Rural Development

Dr Nakul Parashar

The advent of science and technology in the rural sector, particularly in agriculture, has seen enormous change and thus, scientific awareness among the farmers. Whether it is soil science, entomology, agronomy, economics, animal husbandry, or pathology, name any branch of agricultural sciences, research & development news from the labs reaches the farmers quite quickly. Bringing in better healthcare facilities to the rural areas has reduced the mortality rate, and healthier lifestyles can thus be seen emerging in the country. The creation of new job opportunities and new business avenues within the rural domain has been the hallmark of science & technology's positive intervention in rural development.

Since childhood, we've been told that the majority of our country's population still resides in rural areas. Our essays too, in our childhood, thus had standard lines about our country being an agriculture-prime nation. This is still a reality even if numbers of migrants from rural to the urban in the last decade have been more than 15.6 percent (as per the 2011 census). Trends indicate that the 2021 census wouldn't be much different either. Hence, the inference is that our rural population is still far more than its urban counterpart. This clearly means that any development done in rural India will be of immense significance.

Science & technology has played a critical role in the development of the nation. For the rural populace, in particular, it has been far more impactful. Bringing in automation in village-based small-scale industry has a direct effect on the growth of the rural economy. Enhanced & advanced farming practices through advances made by science & technology have yielded higher growth per hectare. Bringing in better healthcare facilities to the rural areas has reduced the mortality rate, and healthier lifestyles can thus be seen emerging in the country. The creation of new job opportunities and new business avenues within the rural domain has been the hallmark of science & technology's positive intervention in rural development. Generating a more logical mindset through effective science & technology communication by using electronic & digital media meaning generating scientific temper amongst the rural folk has tremendously helped the people living in villages. Bringing new yet technologically advanced communication systems into vogue has also changed the way education was imparted in the rural Indian world so far. Summarily, the availability of

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updated content required by the rural folk timely has been one of the many advantages that science & technology has provided to rural India. The list is indeed longer than we can think of.

At the India International Science Festival held in November, 2019 at Kolkata, it was indeed heartening to see how farmers from various parts of the country had several success stories to share with and yet, all of them had one thing in common: science & technology. Rajkumari Devi, Hukumchand Patidar, Bharat Bhushan Tyagi and many more, the list of success stories from the rural world is rapidly increasing.

Known as Kisan Chachi, Rajkumari Devi from Bihar sought initial help from Rajendra Prasad Central Agricultural University in Samastipur. Hukumchand Patidar from Jhalawar in Rajasthan experimented with organic farming and met success with improved commodity farming. At a conference, when asked; Patidar accepted how systematised and scientific approach to his efforts helped him organise his post-farming economics. Similarly, Bharat Bhushan Tyagi, another progressive farmer from Uttar Pradesh credits his science education to assist him in his advanced farming & post-farming success. These are a few of the many success stories that have bagged the limelight during the past few years. Interestingly, all of these names mentioned here, have won the prestigious Padma Shri Award.

The advent of science & technology in the rural sector, particularly in agriculture, has seen enormous change and thus, scientific awareness among the farmers. Whether it is soil science, entomology, agronomy, economics, animal husbandry, or pathology, name any branch of agricultural sciences, research & development news from the labs reaches the farmers quite quickly. Water, soil, and seeds are the key driving forces for agricultural development. Adaptive technology-agriculture, for example focuses on demand-side water management. Such initiatives identify more efficient technology and practices that save more water in agriculture. In fact, this is just one and the repositories of such richer and result-oriented practices are numerous.

Internet was made available to us through the telecom revolution of mid-nineties and our country managed to ride the telecom bandwagon in time. Thus, we feel proud that today, every nook and corner of the nation is widely connected with mobile telephony. All of this spearheaded the mission to get every citizen duly connected with the information expressway. So, whatever new that happens across any part of the world or within the nation with regards to any new farming practice, seed or variety, trends in the market, availability of food processing units,

and much more–it's now available with the farmer instantaneously.

Accurate weather forecasting has played a significant role in improving lives of our rural populace. Gone are the days, when natural disasters used to leave behind a trail of mass destruction especially in the rural areas. With advance & accurate forecasting, our meteorological department has come of age. Advanced information helps Ministry of Rural Development to work in close association with various S&T ministries to evolve strategies to mitigate risks emanating from these natural disasters. Deficit- or excess-rainfall, tsunami or drought, these scientific advancements have helped our national disaster management agencies to swing into action in time and evade any major catastrophe to happen. If not fully, a majority of the risk, in any case, gets averted. Speaking about how weather predictions over a period of time have improved and become more and more accurate, Anand Shurma of IMD had emphasised that the rural sector in India happens to be the biggest beneficiary of these developments. According to him, these predictions have helped a farmer plan his entire cycle from seeding the crop to its sale in the market-place accurately.

Rural development is not confined to farming and agricultural produce only. People living in villages or small towns have requirements, issues, and solutions quite similar to those living in cities. For example, issues related to internal roads and lanes, their planning and regular maintenance with lighting, etc. aren't any different. Issues of health, hygiene, and community health related issues are comparable with those in city areas. Education and developing scientific temper are other areas of comparison between the two. In other words, rural development requires the involvement of science & technology in an almost similar fashion. Thus, the role of science & technology in rural development should be treated in a holistic manner.

Besides, the Government of India's relentless endeavours to make the citizens in the rural sector duly aware of its efforts, a number of scientists and technocrats have come forward to help the rural sector. They have thus, set up non-government

agencies to run various projects. These projects have proven to be positive catalysts in improving the lives of the rural masses. In areas near Delhi, Mewat to be particular had a lot of issues related to health, hygiene, education, farming practices, and overall development. Building dams, starting skill-enhancement programs, creating scientific temper through community radio, they have continuously contributed to a number of projects. This, clearly demonstrates how effective the role of science & technology in rural communities is in order to create sustainable programs for managing water resources, increasing agricultural productivity, and strengthening rural governance.

Now, that we have realised the power of science & technology's role in rural development, it's important to ensure that science communication and popularisation with due extension takes place on the ground. For this, every science & technology agency, department, related ministry of the Government of India has a strong outreach organisation or cell dedicated to ensuring that the rural populace is duly benefitted by it. Vigyan Prasar, for example, is one of the many such departments that have been into existence for the past thirty years. Utilising the tremendous power of all four media-print, electronic, social and digital, Vigyan Prasar has produced more than 300 originally-written titles in popular science. Indiascience.in, India's 24x7 OTT channel provides valuable video media to the country's population. With more than 2500 network clubs, mostly in the rural areas, VIPNET (Vigyan Prasar Network Clubs) provides updated information about the developments in science & technology through newsletters, exhibitions, seminars, webinars, and other means of communication. Vigyan Prasar publishes a popular monthly called Dream 2047 in Hindi and English that carry articles that are interesting and understandable by one and all. For effective communication, it is important to connect with people in their preferred language. For this, Vigyan Prasar has embarked upon outreach programs in Indian languages. Programs in Urdu, Bengali, Tamil, Kannada, Marathi, and Maithili have begun and others are yet to start shortly. Monthly newsletters in these languages have started to reach the rural sector. Tajasus in Urdu, Bigyan Katha in Bengali, Ariviyal Palagai in Tamil and Kutuhalli in Kannada have already begun.

Social media is yet another powerful medium to aide S&T development's outreach in the rural domain. Vigyan Prasar has a dedicated group that manages science & technology updates and gets them to the rural populace timely and effectively.

The list of science & technology's role in rural development is humongous and is growing as we speak. A lot has been spoken about. A lot of research has been done and it continues. Its efficacy is well proven. Yet, there are still a lot of areas where its effective and complete implementation is yet to be achieved. One thing is for sure-science & technology have made far more inroads into rural development than any other aspect of our life. They are and will remain inseparable partners always. ❑

Resilient Health Systems

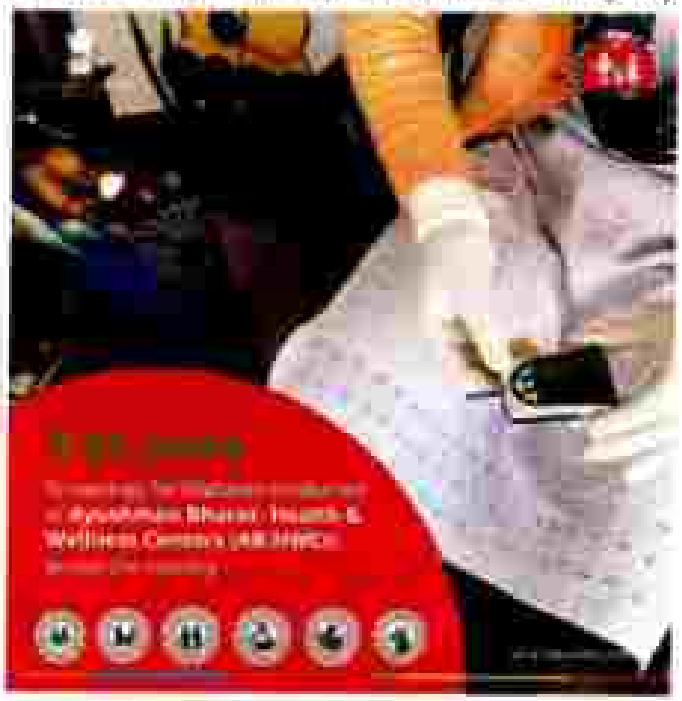
Dr Manisha Verma
Siddhartha Kumar

India has exhibited consistent progress in ensuring strengthened health systems and infrastructure over the years. It is committed to building effective and efficient health delivery systems and attaining the highest possible level of health and well-being for all, at all ages, through a preventive and promotive health care orientation in all developmental policies, and universal access to good quality health care services without anyone having to face financial hardship as a consequence.

No other adage carries as much significance as "healthy people, healthy nation", in the present context. The COVID-19 pandemic has forcefully pushed the importance of investment in resilient health systems across the globe. Nations have been reminded again about the critical importance of health forming the formidable foundation of any prosperous and productive nation.

When we talk about health systems, it signifies a collective term comprising of various interlinked components such as health financing and financial protection; health service and quality norms; trained and skilled human resources; health infrastructure; medical education, effective regulatory systems, equity and access to health services, multi-stakeholder participation, community engagement, and reforms, to name a few.

India has exhibited consistent progress in ensuring strengthened health systems and infrastructure over the years. The National Health Mission launched in 2005 has provided the much needed national framework for various initiatives and interventions for advancing the public health agenda. In the recent years, one national initiative that has been globally lauded as one of the largest public health programmes is Mission Indradhanush. It was launched on 25th December 2014 and rolled out on World Health Day, 7th April 2015. Aiming for Full Immunisation Coverage (FIC), this programme was introduced to accelerate the annual immunisation coverage from an average of 1% in geometric progression. Before 2014, the national immunisation coverage stood at 65% with an annual growth of 1%. At this speed, India would have taken more than 25 years to achieve 90% immunisation coverage. In order to speed up the coverage rate, India set up an ambitious target of achieving 90% FIC by 2020. The Government strengthened the basket of vaccination services via a life-cycle continuum of care approach for both pregnant women and children. Seven diseases that were targeted included Diphtheria, Whooping Cough, Tetanus, Poliomyelitis, Measles, Meningitis and Hepatitis B, and that is why the programme was christened as Mission Indradhanush (Mission Rainbow). On a yearly



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years, new additions to this basket have been made by the Ministry of Health & Family Welfare (MoHFW). In 2016, vaccines pertaining to Japanese Encephalitis, Rubella, Inactivated Polio Vaccine (IPV) and Rotavirus were added, and 2017 saw the addition of Pneumococcal Conjugate Vaccine (PCV), to address pneumonia under the aegis of this program. Pentavalent vaccine with five antigens (Diphtheria, Pertussis, Tetanus, Haemophilus influenzae type b (Hib) and Hepatitis B) was expanded to all the states in the year 2015.

While the Government of India led the initiative, international agencies such as WHO, UNICEF, Bill & Melinda Gates Foundation, Rotary International etc., were roped in to augment the efforts in robust planning, capacity building of the frontline workers, accelerated behavior change communications, and monitoring and evaluation of the programme. An exhaustive intervention of this magnitude was certain to produce the desired results. While the annual immunization coverage shot up from 1% to approximately 6.7% per year in 2015 itself, a survey carried out in 190 districts covered in Intensified Mission Indradhanush (5th phase of Mission Indradhanush) showed 18.5% points increase in full immunization coverage as compared to NFHS-4 survey carried out in 2015-16.

The various phases during this mission also saw the implementation of Gram Swaraj Abhiyan and Extended Gram Swaraj. This assured increased community participation and individual engagement with the flagship mission. While the Accredited Social Health Activists (ASHAs) played the most important role of mobilising the beneficiaries, the motivated Auxiliary Nurse Midwife (ANMs) administered vaccines to approximately 33.6 million children and 9.46 million pregnant women in the past six years across seven phases. These have been spread across approximately 600 districts in 36 States and Union Territories (UTs). Thus, the empowerment of Human Resources of Health (HRH) like ASHAs and ANMs, has assured the movement of the mission's vehicle, till date. Therefore, it comes as no surprise that such a highly successful public health programme was rightly cited as one of the 12 best global health practices in the world.

Furthermore, the two subsequent phases of Intensified Mission Indradhanush have also contributed in accelerating the administration of vaccines across 173 and 272 districts, respectively. The first phase aimed to achieve the full immunization target (90%) by December 2018, the rebooted second phase of IMI took off in a more structured and cohesive manner in mid-2019. As a result of these targeted interventions, the Full Immunization Coverage (FIC) has reached 91.16 % (in 2019-20).

The Government strengthened the basket of vaccination services via a life-cycle continuum of care approach for both pregnant women and children. Seven diseases that were targeted included Diphtheria, Whooping Cough, Tetanus, Poliomyelitis, Measles, Meningitis and Hepatitis B, and that is why the programme was christened as Mission Indradhanush.

To enhance the quality of vaccines and supply chain, the Government of India effectively introduced the indigenously developed eVIN (Electronic Vaccine Intelligence Network) which seeks to ensure supply of vaccines and cold chain maintenance through technological solutions. It provides real-time information on vaccine stocks and flows, and storage temperatures (to be maintained at 2-8 degree centigrade) across all 27,000 cold chain points in

the country. Along with UNDP, the initiative has been successful in saving 90 million vaccine doses with the influenza rate of 99% in maintaining the vaccine supply and temperature norms, thereby improving the coverage and quality of vaccination program in India. In view of its benefits, eVIN has been successfully piloted by countries like Indonesia, Sudan and Malawi.

In the recent years, another major flagship program of the Central Government that has gained massive traction in Ayushman Bharat (AB), with its twin pillars of Health & Wellness Centres (HWCs) which provide primary and secondary health care, and Pradhan Mantri Jan Arogya Yojana (AB PMJAY) for provisioning of health assurance to the most vulnerable and needy population (approximately 10.74 cr poor and deprived rural families covering almost 50 cr people that form the bottom 40% of the population pyramid). PMJAY was launched on 23rd September 2018 and covers the biggest target population for any such health insurance scheme in the world.

In trying to bring the Comprehensive Primary Health Care services closer to the doorsteps of the beneficiaries, Ayushman Bharat Health & Wellness Centres (AB-HWCs) go a step further in targeting communities as the beneficiaries of the primary health care services. Additionally, they cover services related to both maternal and child health and non-communicable diseases. An evolutionary model of the sub-centres and primary health care centres, HWC are patterned at becoming centres of excellence for comprehensive primary health care services. With vastly improved aspects of community participation, institutional reforms and free access to medicines and vaccines, HWCs form a major component of strengthened health care systems in India today. Also, this will certainly enable improvements in existing and the creation of new health care facilities in rural, remote and underserved areas of our country. As on date, 40,644 AB-HWCs have become operational with total footfalls amounting to 15.79 crore of which 8.56 crore are women. Moreover, 4.23 crore population has been screened for hypertension; 3.55 crore for diabetes; 1.25 crore for breast cancer; and 82.54 lakh for cervical cancer. More than 11 lakh sessions of yoga have also been held across the HWCs.

The second component of Ayushman Bharat, PMJAY, besides providing health assurance of 5 lakh rupees per family for tertiary care hospitalisation, has not only increased the scope of better health care services and health systems in our country, but has also made up for the alleged lack of budgetary allocation to the public health sector in the past few years. The Government has also covered 23 specialities with this programme in both private and public sector hospitals, thus pushing the discussion on private sector hospital's contribution to UHC to the backburner. In fact, this programme will be useful in aligning the private sector hospitals with public health sector goals. Recent data indicates that 12.46 crore beneficiaries have been provided the scheme cards; 21,583 hospitals have been empanelled; there have been over 1 crore hospital admissions (70.9 lakhs since 1st June 2019) and treatments of Rs. 13566.72 crore have been provided.

> **Accredited Social Health Activists (ASHAs) played the most important role of mobilising the beneficiaries, the motivated Auxiliary Nurse Midwife (ANMs) administered vaccines to approximately 37.8 million children and 9.46 million pregnant women in the past six years across seven phases.**

to the beneficiaries. Moreover, over 1.08 lakh hospital admissions have been authorised under portability of services. A National Call Centre (toll free number-14555) was set up by National Health Authority on 24th August 2018 which has recorded 20 lakh inbound and 70 lakh outbound calls since 1st June 2019.

The direct benefits of PMJAY are tangible enough for everyone to see. While it would certainly bolster India's march towards achieving UHC, it is also bound to positively impact our realisation of Sustainable Development Goals (SDGs) in general and SDG-3 (Good Health and Well-being) in particular. Another major highlight of this component is that it is bound to significantly reduce out-of-pocket expenditure on medical care and seeking health services.

The major dimensions of public health in which India has taken giant strides in the past six years is the Reproductive Child Health (RCH) programme. All the key RCH indicators namely Maternal Mortality Ratio (MMR), Neonatal Mortality Rate (NMR), Infant Mortality Rate (IMR), Under-Five Mortality Rate (U-5MR) and Total Fertility Rate (TFR) etc., have recorded appreciable improvements. They have provided us with significant evidence regarding the rapid and wholesome progress of health care systems in India. It was also during this period in time that due to burgeoning health systems, the policy makers in Ministry of Health and Family Welfare, Government of India, successfully led the Maternal and Neonatal Tetanus Elimination (MNTE) validation to achieve the target in April 2015. This was another feather in the cap of the Government of India after achieving Polio Eradication in March 2014.

During this period, India laid sharp emphasis on newborn care, therefore scaling of Special Newborn Care Units (SNCUs) have been at the forefront of improved newborn and infant healthcare in India. With the establishment of 794 SNCUs in district hospitals and medical colleges, 0.85 million beneficiaries are being admitted annually in these facilities for round-the-clock services provided at SNCUs. In conjunction with this flagship initiative, other interventions to improve child health care in India have been of critical significance. Universalisation of Vitamin K injection at birth, Antenatal Corticosteroids during preterm labour, Kangaroo Mother Care (KMC) and administration of Gentamycin injection to newborns by ANMs in order to treat newborn sepsis; all have boosted the prospects of saving as many newborns and infants in India over the last six years. These high impact interventions protect the newborn babies against sepsis, periventricular and intraventricular haemorrhage, birth asphyxia, pneumonia, diarrhoea, etc. amongst others.

> To enhance the quality of vaccines and supply chain, the Government of India effectively introduced the indigenously developed eVIN (Electronic Vaccine Intelligence Network) which provides real-time information on vaccine stocks and flows, and storage temperatures across all 27,000 cold chain points in the country. The initiative has been successful in saving 90 million vaccine doses with the adherence rate of 99% in maintaining the vaccine supply and temperature norms, thereby improving the coverage and quality of vaccination program in India. In view of its benefits, eVIN has been has successfully piloted by countries like Indonesia, Sudan and Malawi.

A major policy breakthrough for maternal health care services came about in June 2016 with the implementation of Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA). Under this programme, all pregnant women in our country are provided fixed and free Antenatal Care (ANC) services on the 9th of every month with the participation of the private sector. This not only helps in improving the quality of antenatal care, but also helps majorly in identification of high-risk pregnancies at the very outset. As on date, over 2.44 crore pregnant women have benefited through special ANC check-ups, over 1.26 crore pregnant women have received PMSMA

services in 2nd/3rd trimester for the first time; more than 12.8 lakh high-risk pregnancies have been identified and over 8301 private sector volunteers have registered to provide voluntary services under PMSMA.

The Government of India's premier think tank, NITI Aayog, has spearheaded the implementation and oversight of the "Transformation of Aspirational Districts" (TADP) Programme of the Government of India. While this programme aims to uplift those backward 117 districts in India that are lagging behind in specific development parameters of health and nutrition, education, agriculture and water resources, financial inclusion, skill development, and basic infrastructure, it is interesting to note that the maximum weightage (30%) amongst the six core thematic areas of this programme has been accorded to health and nutrition. It is no surprise then that the Government of India expects to draw strengthened health systems as the major takeaway from the implementation of this programme.

In the wake of the global pandemic of COVID-19, there is a renewed realisation that investment in sturdy and resilient health systems is an investment in strong foundations of a prosperous nation. As noted in the National Health Policy 2017, India is committed to building effective and efficient health delivery systems and "attain the highest possible level of health and well-being for all at all ages, through a preventive and promotive health care orientation in all developmental policies, and universal access to good quality health care services without anyone having to face financial hardship as a consequence". Thus, it envisages to achieve through increasing access, improving quality and lowering the cost of health care delivery. ❑

Effective Resource Management

In 2019, the World Economic Forum's Risks Report indicated that a global water crisis is the fourth most impactful risk and the ninth likeliest. The Urban Climate Change Research Network forecasted in 2018 that 650 million people living in 500 cities will be vulnerable to reduced freshwater availability in the 2050s. According to the World Bank in 2019, India specifically is one of the most water-stressed countries globally, and NITI Aayog found that many Indian cities were on track to run out of water in the next few years, if not already in the midst of the COVID-19 crisis.

For communities to become self-reliant, they must invest in sustaining availability and access to the resources that define their existence–namely, water and sanitation. While the challenge may seem daunting, the Government of India has introduced programmes over the past few years–such as Jal Shakti Abhiyan, Swachh Bharat Mission and Jal Jeevan Mission–which seek to prioritise solutions that improve water security and supply and sanitation access, with a focus on drought-prone regions of the country. These programmes do not only address needs in terms of resource management, but also in terms of the potential to provide livelihoods to a 'bulging youth' population aging into a demographic that is ready to work, contribute to the economy and improve social cohesion.

India comes with many strengths that can be leveraged to invest in these convergent, multi-scheme initiatives: a large population with ready human resources interested in skilling and entrepreneurship, strong and numerous local grassroots organisations that understand the needs of their communities, state governments with experience and the ability to fund locally contextualised approaches and, finally, the resilient communities themselves who have shown time and time again that when they take problems into their own hands, they are able to advocate for and implement solutions that work and generate further livelihood opportunities for their people.

The following case studies highlight how leveraging the above assets in Bihar and Odisha provides new pathways for employment that contribute to building a self-reliant India while ensuring water and sanitation services for years to come.

CASE STUDY: BIHAR

CASE STUDY: ODISHA

Harnessing Skills of Incoming Migrants

Rajeev Kumar

Many of the migrants are returning with newly honed skillsets, learned in the cities they originally emigrated to earn livelihoods. Atmanirbhar Bharat focuses on developing infrastructure and support to the micro, small and medium enterprises (MSME). Focus on government projects with clear social development objectives such as water sanitation and hygiene, nutrition, and rural development goes a long way in developing self-reliant community.

India's response to the COVID-19 pandemic was to introduce a lockdown, under which business closures drove hundreds of thousands of migrants to return home to Bihar. According to recent statistics from the Bihar State Disaster Management Department (BSDMD), the state received more than 1.5 million returnees in the state's quarantine centres (BSDMD, 2020), and numbers are expected to increase in the coming weeks as public transportation options become available.

Background

These returning migrants would require employment opportunities in short-term and long-term. Most of these returnees were forced to migrate in the past due to very limited employment opportunities available year round. Many of these migrants will return to their employers as industrial and other economic activities pick up in their states of employment. Therefore, time is key factor in responding to their needs and balancing other priorities.

The Government of Bihar has a two-pronged strategy to leverage this suddenly available manpower towards developing the state. In the short-term, the state wants to recruit manpower for waged labour for existing social development schemes. In the longer-term, the state wants to lay down an ecosystem that supports establishing large and decentralised industrial opportunities within the state, in part to build on to the manpower available.

Training in East Champaran district

Therefore, the state's government is working to:

1. Map skillsets of all incoming migrants: At the district level, skill mapping is conducted for all incoming migrants to understand what supply exists to meet demands, and estimate employment needs. The skill set will be classified to match if they can be engaged in currently undergoing development activities. Initial data, as per government notes, suggests that approximately 50-70 per cent of the returnees were working in construction industry (Government of Bihar, 2020).

2. Develop comprehensive district employment plan: The Government of Bihar is working on developing district employment plans which would include details of both wage employment and self-employment opportunity both under

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the State Rural Livelihood Mission and other development projects. It is also seeking to entice industries to set up in Bihar by providing concessions and promotions under its new Industrial Investment Promotion Policy (Government of Bihar, 2020).

Engaging Migrants Labour in Existing Developmental Activities

The Government of Bihar has large projects which have accrue benefits for population in the form of better hygiene, lower morbidity, availability of tap water at home, increased availability of soil moisture and an overall greener environment. Jal Jeevan Hariyali (JJH) with consolidated allocation of Rs. 24,324 crore for next three years envisions a disaster-resilient Bihar by investing in environment sustainability through afforestation, re-revival of water bodies, and rainwater harvesting.

Lohiya Swachh Bihar Abhiyan (LSBA) has potential of providing opportunities for employment of skilled labourers. At national level it is estimated that, by 2023-24, construction of SBM infrastructure (remaining solid waste management, etc.) and information, education and communication (IEC) activities would create an additional 5.63 million Full Time Employment (FTE) jobs (UNICEF, 2020).

The Bihar government is also engaged change activities, under the LSBA, which is likely to sustain the toilet usage. This regular toilet use by all members of the household would encourage households to invest in keeping toilet functional and upgrade it at some point. Some of these potential latent employment opportunities can be harnessed by the state towards enterprise development in long run. An estimate done for toilet built under SBM in Bihar, indicated need of Rs. 23,308 million for retrofitting in coming years. Large part of this cost covers labour cost (UNICEF, 2019).

The Government of Bihar is also implementing the ambitious scheme – Har Ghar Nal Ka Jal – under the national umbrella of the Jal Jeevan Mission (JJM), in order to provide functional household tap connections (FHTC) to all households in the state. This requires setting up of more than one lakh mini-water supply schemes across the state. These village and town level schemes require trained plumbers and mechanics available to keep them functional. These schemes therefore provide the perfect opportunity for skilled and returning plumbers and mechanics to find jobs closer to home and potentially set up small businesses that can align their activities with JJM's goals. This provides potential opportunity for skilled returning plumbers to get engaged and possibly create small business around annual maintenance of these schemes on decentralised basis. The government has earmarked Rs. 12,000 per scheme per year.

Similarly, the state government's flagship programme, Jeevika, the state's rural livelihood mission, has a membership of more than 10 million households. One activity promoted under it is businesses established by women farmers and producers; these businesses deal in farm produce, processing, and marketing.

Progress so Far

After the migrants' skills are mapped, bridge training is organised at quarantine centres and their services are being utilised in various development initiatives. The trainings are often focused on leveraging existing skills in the targeted participant group and connecting adapting them to be used for new purposes. For example, trainings on poultry and goat rearing, have been initiated in Purnea. Migrants who perhaps had existing experience in construction and labour work were given hands-on training on how to do required masonry work; this has been a particular interest and an effort taken up by all. This initiative was conducted as part of Jeevika, and trained or already skilled migrants have already been deployed to support work under the Mahatma Gandhi National Rural Employment Guarantee Scheme (MNREGS), for JJHM and LSBY.

Inclusion of units for production of organic manure and pesticides is another area that can generate employment under IHM. Organising unskilled labour (in the unorganised sector) for cleaning, fumigation and disinfection of institutional/ community toilets, public buildings has huge opportunity for employment generation as janitorial support under SBM's urban and rural initiatives.

Development of Industrial Clusters

As part of the 2016 policy to develop local and sustained industries, the state identified four high priority sectors with potential for significant gainful employment:

1. Food Processing
2. Leather
3. Textile
4. Information Technology, Information Technology Enabled Services, and Electronics System Design and Manufacturing.

There is already a pool of supply as some returning migrants had been previously employed by export houses in other states dealing in textile and leather. The Bihar government, after identifying their skills, is working to connect them with initial capital sourced from scheme such as Mudra Yojana, and provide them with better transportation access so that they can connect their products from anywhere in the state to the bigger consumer pools in cities. Operationalisation of airports in northern part of the state, specially in Darbhanga and Purnea can be done on priority basis under UDAN (Ministry of Civil Aviation, 2016). Bihar having lower overhead costs and cost of living can potentially offset the cost of starting business in the state, given the greater affordability of resources and manpower.

Revival of canal in Bhagwat district

Conclusion

Bihar, like the rest of India, has a large proportion of youth and young adult populations—which is favourable for building a community of entrepreneurs and businesses, which in turn can increase availability of jobs in the state. Therefore, while the State already has a mapped policy for investing in industrial development, the state can also explore the space for developing complementary policies that cater to the livelihood needs of skilled migrants coming home indefinitely.

The prospect for making Bihar more self-reliant going forward is in reach, given that all stakeholders—government, civil society organisations, private players- work together to offer migrants an enabling ecosystem that is competitively positioned.

References

1. Bihar Industrial Investment Promotion Policy, 2016. http://industries.bih.nic.in/Acts/AD45-46-09-2016.pdf
2. Government released Minutes of the Meeting (MoM) held on 29 May, 2020
3. Ministry of Civil Aviation, 2016. https://www.civilaviation.gov.in/sites/default/files/Final%20Regional%20Connectivity%20Scheme%20%28RCS%29.pdf
4. Bihar State Disaster Management Department, http://disastermgmt.bih.nic.in/CONTD-16/Book_4006.pdf
5. National Economic Impact Evaluation of the Swachh Bharat Mission, 2020, CSE/CDF India
6. Sustainability Assessment: Usage, Technology, and Functionality of toilets in rural Bihar, 2019, CSE/CDF India

Improving Livelihood Opportunities

Shipra Saxena
Narendra Singh Chouhan

Lack of livelihoods combined with lack of access to clean water and food has effects on the current population as well as knock-on effects on future generations born into homes that do not have the ability to provide for them. Immediate effects are often felt by children, for whom malnutrition can have lifelong effects on mental and physical development, and by women and girls, who are often the ones required to bridge the resource gap by carrying water back home, taking care of family members who fall ill, and risking defecating outside without guaranteed safety for themselves.

Introduction

Access to Water, Sanitation and Hygiene (WASH), specifically water, plays a critical role in improving the rural economy of households by offering livelihood opportunities for people living on the margins. Not only do access to toilets, hygiene products and safe water sources improve correlated health and nutritional outcomes, they also improve the productivity potential of income earners by reducing risk of illness and mobility. This in turn feedbacks into the cycle of generating more jobs, education opportunities. In particular, investment in the WASH sector can ameliorate the participation of women and girls, who often are burdened with the task of collecting water for the household, thereby trading away opportunities for betterment and income generation.

An example is Balangir, a tribal district of Odisha with acute water scarcity, inefficient water availability, frequent droughts and inadequate quality over the years affected the livelihood and nutrition security of thousands in the rural regions of the district (SASDAP, 2016). Without dependable sources, farmers struggled to irrigate land and the health of livestock took a toll. In addition, there was a dearth of employment opportunities in the district, which added to the stress on the resident communities. Lack of livelihoods combined with lack of access to clean

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water and food has effects on the current population as well as knock-on effects on future generations born into homes that do not have the ability to provide for them. Immediate effects are often felt by children, for whom malnutrition can have lifelong effects on mental and physical development, and by women and girls, who are often the ones required to bridge the resource gap by carrying water back home, taking care of family members who fall ill, and risking defecating outside without guaranteed safety for themselves.

Convergence of funds from various departments and sources can help create durable community assets (GoI, 2010). Over the last five years, Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) has become the main force that is driving water conservation efforts all across rural India. The scheme has evolved into focused campaign to raise rural incomes through work on natural resource management (NRM). In 2014, the amendment to MGNREGA Schedule I was done which mandates that at least 60 per cent expenditure on agriculture and allied activities. Consequently, a list of permissible works under the Act now in majority inside of activities directly related to improving water security (PIB Delhi, 2019).

Background

Under the lead of the Department of Panchayati Raj and Drinking Water in Odisha, a two-pronged approach was adopted by the state in four districts including Bolangir, started before the lockdown: one would ensure that jobs were provided and the other, necessary water security. The Odisha Livelihood Mission (OLM) and Biju Jagabandhu Assured Water Supply to Habitations (BASUDHA) Scheme promoted access to both livelihood prospects and WASH services, with MGNREGA's policy to support recruiting manpower. The launch of

the state-wise BASUDHA in 2017-18, which is aligned with the larger ambit of the Jal Jeevan Mission and sources support from MGNREGA, cemented Odisha's ambition to provide all families with piped water supply. The launch of Jal Shakti Abhiyan last year, during which over 250 drought-prone districts were targeted through a three-month water conservation campaign, initiated complementary investing in groundwater recharging, rainwater harvesting, borehole repair and maintenance, renovation of water bodies, and so on.

In identified blocks of the four districts (Bolangir, Bargarh, Nuapada and Kalahandi), almost 500 Gram Panchayats were led through a participatory planning process culminating in a Gram Panchayat Development Plan (GPDP) informed by identified hazards, risks and opportunities related to water security and livelihoods. The GPDP then allocated funding to relevant interventions, sourced from various schemes such as MGNREGA and directly allocated budgets. The GPDPs contained opportunities for community members to be trained on work that addressed the fundamental need to prevent soil degradation and improve conservation practices. Some gram panchayats also included nutrition-sensitive interventions such as planting food gardens near anganwadis and around homes. Often, village water and sanitation committees (VWSCs), self-help groups (SHGs), and gaon kalyan samitis (GKSs) were involved to promote integration of key health, WASH and nutrition messaging into training efforts and in campaigns promoting demand for relevant water security interventions. By involving beneficiaries, right from the start in identifying the most appropriate interventions, a sense of ownership was achieved and a self-reliant approach was promoted.

Interventions have been successful in improving water availability at the community level through the installation of check dams, ponds and percolation tanks. It has even seen to the re-emergence of erstwhile traditional practices, such as constructing and allocating water ponds just for cattle, as surface water sources are being invested in once more. In addition, the livelihood-supporting schemes extended to promoting sanitation access as well. Single-pit latrines were retrofitted to have two pits, which not only encouraged sustained use for more years, but also ensured that waste separation from water sources was continued, when constructed properly. In order to promote the cycle of need and demand, households were provided

with fiscal incentives to support the retrofitting efforts, and community-based masons were trained on doing it so that they could offer the relevant services to households in need.

Way Forward

According to an assessment by IIT, Kharagpur, the convergence measures in Odisha seem to have turned out positive results. The State is continuing to invest in this convergent approach to improve water security while also providing work opportunities. This is particularly important now given the in-flow of residents of Odisha who suffered economic downturns in other States due to the fallout from COVID-19, and thus will be looking for prospects while back home.

Investment in increasing employment demand now will pay off in short and long-term returns, through more generated income that will go towards a family's education, nutritional security, and ability to access more opportunities. Leveraging existing and intersectional manpower needs through various sectors such as WASH, while encouraging community-level ownership, will lead to building a more self-reliant Odisha.

Conclusion

While the water, sanitation and hygiene sector proves to be an exciting investment for those interested in skilling future generations of workers and creating more opportunities to invest at home, it is not the only one with such high potential and nor should the investment in it be siloed. There are many possibilities ahead of us for addressing the intersectionality in development. The WASH sector, for instance, can affect nutritional outcomes and advocate for climate resilient healthcare facilities, and other sectors, such as education, can benefit from investments that strengthen policies prioritising water supply and nutritional interventions. Therefore, this is only the beginning and many ideas lay ahead of us to be explored and tried, all the while keeping communities up front and center.

Disclaimer: All views, thoughts and opinions are personal and do not necessarily reflect on the position of the authors' organisation.

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References

1. SANDRP2016May Odisha-drought-profile https://sandrp.in/2016/05/20/odisha-drought-profile-2016/
2. S Panneerselvam Journal » Vol. 32, Issue No. 8, 25 Feb, 2017 » Can India Be A Beacon Of Hope For The World? https://www.epw.in/journal/2017/7/web-exclusives/can-india-be-beacon-hope-world.html
3. Government of Odisha (2014) Roadmap on Convergence of MGNREGA with other Schemes in Odisha. Odisha, Bhubaneswar: Government of Odisha, Panchayati Raj Department, FY-2014-15.
4. IIT Kharagpur assessment on MGNREGA for NIRD&PR Hyderabad https://nirdpr.gov.in/ [illegible] NREGA%20in%20Odisha.pdf
5. Water Conservation under MGNREGS, Ministry of Rural Development 02 JUL 2019 by PIB Delhi https://pib.gov.in/PressReleasePage.aspx?PRID=1576120 [illegible] Management%20(NRM)%20works
6. IJARR, 2(3), 2017; 35-4
7. https://www.newindianexpress.com/cities/bhubaneswar/2020/may/28/ [illegible]
8. For the migrant workers who have returned to Odisha, Rs 1,000 crore would be spent for creation of 1.85 lakh farm ponds under "Mo Pokhari" initiative.

Gandhiji's Approach of Self-Reliance

Dr D P Singh
Moni Sahay

In modern history, one of the earliest proponents of the notion of self-reliance was Mahatma Gandhi, who provided a distinct and alternative paradigm of development to strengthen rural economy and promote indigenous production to attain self-sufficiency. His earliest undertakings got reflected in the Hind Swaraj (1909) where he presented his views about localism and grass root level participation, role of local community, its capacity to produce, generate and provide to all, within a community, a sustainable living. Later, he also placed his agenda in The Constructive Programme (1941), where he stated about construction of Poorna Swaraj through truth and non-violent means and with independence of each and every unit.

Self-reliance is a vision that indicates towards activities that are self-supporting in economic terms and indicate reliance on one's own resources and having means to an end. India had a self-reliant economy and society since the Indus Valley Civilisation, which was based on traditional methods of production, be it agriculture or non-farm practices.

The involvement of the community for development was widely being discussed in the development debates across the world during the early 20th century under the theme of rural development and community development programmes. The focus of the strategy was on participation of people in the development process instead of any agency being made responsible to bring about the desired welfare and development. It was being viewed as a "radical alternative" to the conventional growth trajectory. Also known as the Bottom-up Approach, it believed that individuals have cognitive limitations and any individual does not possess the capacity to understand the complexities of a whole system. Therefore, there must be a system which is "people centric" and is a participatory model of development where, the community at the grass root level is prominent and his involvement in the socio-political and economic transformation.

The *Hind Swaraj*

The economy and political views of Mahatma Gandhi strongly reflected his philosophy of life. The *Hind Swaraj* was his initial treatise which described his vision about self-sufficiency of village communities in basic aspects of life. According to him, "an individual, a village, a country could become independent only if it became self-sufficient". His concepts can be placed under two categories. The first relating to self-control and moral development, which was possible through the development of mind, body and soul and gets reflected in the practice of truth, non-violence

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and non-possession. An individual acquires the *soul force* by practicing these which according to him, was the main precondition for success in all efforts. It also empowers individuals to limit their desires, emotional excesses and propensity to maximise gains, which in turn goes a long way to create an ecological-environment balance where, the rate of exploitation does not go beyond the rate of replenishment and there is always a surplus natural stock. According to him, "if national life becomes so perfect as to become self-regulated, no representation becomes necessary". The second category relates to self-reliance including aspects of local governance and economic development. He believed in participatory governance and meaningful linkages of it with agencies above, in the hierarchy so that an intimate network could be established instead of remote networks with a distant governing body. Economic development to him, did not mean about having more, but about being more. His idea of economic development focused on making villages self-reliant. A country he felt, could become independent only if it is self-sufficient and this starts right at the village level by localising production as well as consumption. He stressed on the need for village revival through revival of its economic activities. Emphasising the idea, he wrote, "Indian villages produced and supplied to the Indian towns and cities till their wants. India became impoverished when our cities became foreign markets and began to drain the villages dry by dumping cheap and shoddy goods from foreign lands". His ideas also got reflected in his concept of *Swadeshi*. His schema of village revival spoke about self-sufficiency in cloth and food production. Foreseeing that agriculture alone could not become the mainstay of the masses, he proposed achieving self-sufficiency through crafts for livelihoods. With a greater emphasis on weaving and spinning, he also stressed on all other crafts that formed a part of the hereditary occupation of the villagers, hence promoting the artisan economy. The village activities according to him, had the potential to generate income as well as employment. In contrast, he also expressed his aversion to modern machine civilisation and believed that consumption should be limited to objects that could be produced without machinery. Machines according to him should not take charge of development because the idea of having machines to save labour is guided by greed and not philanthropy, is aimed at profit maximisation and leads to concentration of wealth. He also opposed the mass production of commodities because it eventually gets dumped down to the village market, thus leading to destruction of the village production system. He also stated about the ecological degradation associated with industrialism. He was not against industries but against industrialism, which led to concentration of wealth and where the driving force is not to save labour but greed.

The economy and political views of Mahatma Gandhi strongly reflected his philosophy of life. The Hind Swaraj was his initial treatise which described his vision about self-sufficiency of village communities in basic aspects of life. According to him, "an individual, a village, a country could become independent only if it became self-sufficient". His concepts can be placed under two categories. The first relating to self-control and moral development.

The Constructive Programme

His subsequent writing in the Constructive Programme (1941, revised in 1945) reflected upon his ideas further. The ideas are contained in a booklet that he wrote in 1941, followed by a series of discourses and speeches on the theme. He described Constructive Programme as complete independence through truth and non-violent means, with independence of each humble unit without distinction of race, colour or creed. It was a programme of individual change, followed by social change and faith in the following *Ilm Purna Swaraj*. He envisioned to build a strong civil society so that the benefits of independence could percolate down to the masses and for this, he intended to create a network of local leaders who would work for creative change of the nation. He also attempted to reach out

to the historically marginalised and ignored sections of the society like the untouchables, women, peasants and labourers, students etc. whom he considered the agents in the process of nation building. He wished to cover the gulf between such communities and the mainstream with firm faith and desired to recoup several other spaces of concern such as sanitation and hygiene, agricultural development, education including adult education and other caste and communal relations. He basically intended to bring a radical modification at all levels and all spaces. Khadi and other village industries were always in focus within his schemes. According to him Khadi "connotes the beginning of economic freedom and equality of all within the country" and indicated "decentralisation of the production and distribution of the necessaries of life". Similarly, other village industries and allied handicrafts such as hand-grinding, hand-pounding, soap-making, paper-making, match-making, tanning, oil-pressing etc. and other arts and handicrafts peculiar to regions of local specificities involved labour, provided livelihoods. These products therefore for him were important and everyone should make it a point of honour to use them and which will help in developing a "true national taste" of new India, where "pauperism, starvation and illness will be unknown". He believed in the non-violent power of the peasants who form the backbone of production and should be empowered but never exploited for any political purpose. Strengthening of these communities will also lead to economic equality in the long run and abolish the existing inequalities.

His thoughts were futuristic and his ideas encompassed some thinkable and very workable propositions about self-sufficient villages which would lead to:

- Villages becoming small units of production, using machinery which are labour facilitating and not labour replacing.

- Protection of the artisan economy and dying of traditional handicrafts which have the potential to create a world market.
- Revival of the agriculture and allied activities (agro-based and other non-farm activities) to generate livelihoods.
- Generation of economic activities which are not dependent on land but yet provide livelihoods.
- Check on village out migration due to seasonal unemployment in agriculture.

The interconnections and interlinkages across nations in the contemporary world have led to interdependencies, that have created the present economic order. India too is at a level playing field and is one of the fastest growing economies of the world and much of its future potential of growth depends on its current policies to strengthen the economy and at the same time ensure welfare of its people and protection of their rights in the most equitable manner.

- Lessening of ecological impact on environment due to overutilisation of resources for mass production and consequent pollution.
- Utilisation of local specificities in terms of resources and traditional knowledge.
- Self-sufficiency in terms of power through renewable sources and water through its own waterworks, thus making science and technology serve in the villages.
- Lessening of the development divide and contrasts between the villages and cities.

The Contemporary Relevance

However, in this era of mass production, materialism and consumerism, there appears to be quite a drift from the environment, social milieu, traditions and traditional knowledge, facilitating science and technology, that was perceived and proposed by Gandhi.

The interconnections and interlinkages across nations in the contemporary world have led to interdependencies, that have created the present economic order. India too is at a level playing field and is one of the fastest growing economies of the world and much of its future potential of growth depends on its current policies to strengthen the economy and at the same time ensure welfare of its people and protection of their

rights in the most equitable manner. Being a signatory of the Sustainable Development Goals of the United Nations (2015) India needs to ensure "that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance".

Such goals, in order to be achieved demand a comprehensive planning with inclusion of elements from the grass root level so that they reflect on the realities. The development experience has shifted from a Statist model in the initial decades to gradual withdrawal of the State in the later decades. However, still, some crucial issues of concern, confront us and the facts are not comfortable with respect to equitable distribution of wealth and opportunities and perceived by Gandhi. The Human Development Index (2019) of the UNDP (United Nations Development Programme) placed India at a slightly improved 129th rank among 189 countries. And the Multidimensional Poverty Index of the UNDP (2018) rated India as the country as having a fast rate of poverty reduction. However, the fact remains that India is the second largest country of the world and holds a substantial share of 17.7 percent of the world's population. Indeed, it's a huge size and the welfare of people matter.

The socio-geographical-cultural diversities delimit the scope having a uniform action plan for development. The local specificities, identities and endowments need to be taken into consideration for any development approach. Gandhi mentioned that "the Constructive Programme is designed to build the nation bottom up" and that is conceivable with the involvement of the grass root level representatives for self-reliance and self-contentment. The approach simply does not indicate political autonomy but building the region through insights. The first potential sector lies in the handicraft tradition of India. India has had a rich tradition of handicrafts which is literally the craft of the hand. It forms part of the small scale industry sector and provides livelihoods to lakhs of people in the rural areas. The raw material is localised and the production involves labor assistive technologies. It is the occupation of not just an individual but of the entire family and the community, largely. There is variety, sustainability and resource utilisation prudence in production of these commodities. The secondary important potential activities include most of the non-farm practices that have the capability to provide sustained livelihoods. Since land as a resource is limited, the agro-based allied activities also have considerable potential to create income.

The mission and initiatives towards self-reliant India with emphasis on the micro, small and medium enterprises align with the vision of Gandhi fundamentally. The revision and roadmap could go a long way in protecting and promoting the interests and earnings of the rural masses. The growth of villages and their vibrancy would control the compelling situations of out-migration. The families and communities will be contained and contented. The cities would be cleaner and congestion free. The slums would be less and without dehumanising conditions of existence. The development will be ecologically sustainable. And above all, the spread effect of development would be visible not in certain pockets but the entire length of the land. ❑

References

1. Kumar, K. (2005). Learning to Gandhi. *School, Society and Nation: Popular Essays in Education*, 51-56.
2. Mookkiah, J. S. (2010). Gandhi as a human ecologist. *Journal of Human Ecology*, 29(3), 171-175.
3. Fraser, E. D., Dougill, A. J., Mabee, W. E., Reed, M., & McAlpine, P. (2006). Bottom up and top down: Analysis of participatory processes for sustainability indicator identification as a pathway to community empowerment and sustainable environmental management. *Journal of Environmental Management*, 78(2), 114-127.
4. De Groote, P. (2010). Top-down versus bottom-up mechanisms. *CESifo Economic Studies*, 56(4), 465-497.
5. Hallencreutz, H., & Kitchens, M. (2007). The flowering region: toward a theory of knowledge-based regional development. *R&D Management*, 15(3), 243-253.
6. Amin, A. (1999). An institutionalist perspective on regional economic development. *International Journal of Urban and Regional Research*, 23(2), 365-378.
7. Ghosh, B. N. (2012). Beyond Gandhian Economics. Sage Publications, New Delhi.

Websites

https://www.jansuraj.org.in
http://www.indiagandhifoundation.org/
https://www.mkgandhi.org/

Swachh and Smart Cities

Dr Krishna Dev

A self-reliant India will stand on five pillars viz. Economy, which brings in quantum jump and not incremental change; Infrastructure, which should become the identity of India; System, based on 21st century technology-driven arrangements; Vibrant Demography, which is our source of energy for a self-reliant India; and Demand, whereby the strength of our demand and supply chain should be utilised to full capacity.

'*Charkha*', Mahatma Gandhi's spinning wheel is a symbol of self-reliance and strength of its own domestic industries. It is still the ideal of self-reliance and autonomy. Gandhi turned the humble spinning wheel into a symbol of defiance by asking people to spin their own cotton at home. It thus became a non-violent and creative weapon of self-reliance and independence.

In the 21st century, the lesson of self-reliance is realised again with the COVID-19 epidemic. To curb its spread, the Government of India imposed lockdown in the entire country which was the biggest in its history. In the last six years the aim of 'Aatmanirbhar Bharat' or 'Self-reliant India' was always the top priority, in terms of introducing the schemes such as 'startup India' or 'stand up India'. It is evident that when COVID-19 broke out, India produced a few thousand PPEs and now produces nearly 300,000 PPEs every single day by involving around 200 distilleries. It is the continuous effort of the government since six years that India ranks 63rd among 190 countries, according to the World Bank Report 2020. India made a leap of 14 places from its earlier rank 77 in 2019. And India has improved its rank in 7 out of 10 indicators.

A self-reliant India will stand on five pillars in which infrastructure has the potential to be the identity of India.

Smart Cities Mission

The Smart Cities Mission (SCM) of the Government of India, promotes cities that provide core infrastructure and give a decent quality of life to its citizens, and a clean and sustainable environment and application of smart solutions. Such smart solutions include information and communication technology (ICT) interventions for e-governance and online government services for improving the efficiency of core services at a relatively lower cost. These are build upon the IoT (internet of things) that allows exchange of data over a network, between

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objects and devices, allowing analysis of real-time data that can be used to usher in a new wave of transformative digital services in cities and enhance citizen services and quality of life.

In addition, the Ministry of Urban Development has launched a scheme for "Promoting Innovative Smart Solutions under Smart Cities Mission, Atal Mission for Rejuvenation and Urban Transformation (AMRUT) and Swachh Bharat Mission". The scheme provides funding support for industry-sponsored, outcome-oriented projects focused around the needs of urban local bodies (ULBs) under the Smart Cities Mission, AMRUT and Swachh Bharat Mission.

The core infrastructure elements in a smart city include:

i. Adequate water supply,
ii. Assured electricity supply,
iii. Sanitation, including solid waste management,
iv. Efficient urban mobility and public transport,
v. Affordable housing, especially for the poor,
vi. Robust IT connectivity and digitalization,
vii. Good governance, especially e-Governance and citizen participation,
viii. Sustainable environment,
ix. Safety and security of citizens particularly women, children and the elderly, and
x. Health and education.

The scheme has the following key objectives: (i) to provide a fillip to the development of new and innovative smart solutions that directly impact the needs of cities; (ii) to create availability of funding for practice research of direct relevance to the outcomes desired under the missions; (iii) to make available a large body of pilot tested and proven smart solutions that can be adopted by cities as per their specific needs; and (iv) to promote a culture of innovation within the urban sector.

Integrated Command and Control Centre (ICCC)

Many smart cities in India have started to use the Integrated Command and Control Centres (ICCC) built under the Smart Cities Mission to fight against COVID-19. They are being used to keep tabs on people under quarantine. They are now called as "COVID-19 War Room". Indian cities are driving four kinds of initiatives through an Integrated Command and Control Centre (ICCC):

Testing and Quarantine

i. Mapping of suspected cases to optimal lab location,
ii. No contact sample collection,
iii. Indian Council of Medical Research (ICMR) collaborates with government centres for testing, and
iv. Quarantine checks with geo-fence app.

Containment

i. ICCC as COVID-19 war room with 24*7 helpline,
ii. AI based alerts for lockdown breach,
iii. Drone survey of hotspots,
iv. Corona tracker, e-pass & social apps, and
v. Patient profiling.

Health Advisory

i. Telemedicine helpline & facility,
ii. GIS case tracking or COVID-19 dashboard,
iii. App for video consultation, and
iv. Online counselling for patients via app video calling or helpline.

Essential Services

i. Food and shelters to vulnerable people.

ii. Emergency care.

iii. Rapid response team for outbreaks.

iv. Online order for home delivery of grocery, medicine and

v. Citizen portal for complaints/SOS.

During the difficult and challenging time of corona epidemic, there are many success stories of smart cities to combat and to protect their citizens from COVID-19 in a smart way using ICCC viz. Bhopal, Pune, Surat, Chennai, Agra, Varanasi, Jabalpur, Ujjain, Dehradun, Bengaluru and many more. Here it is important to mention one of the success stories of randomly chosen a smart city viz. Dehradun to see how the smart city is combating COVID-19 epidemic with smart tools.

Dehradun Smart City Limited (DSCL) has utilized the ICCC for monitoring and surveillance activities in the fight against COVID-19. DSCL authorities have worked in collaboration with the District Administration in planning and management of the requirements for combating COVID-19. Dehradun spread public awareness campaign regarding the lockdown and the services that have been provided by the Municipal Corporation and all other government services. The city also motivated people through its various social media platforms, e.g. Facebook, Instagram, Twitter and WhatsApp groups to spread awareness among all the projects of DSCL. The COVID-19 awareness message is being published for the citizens on Variable Messaging Displays (VMDs) placed at critical junctions of the city. Display of Emergency Numbers – Police, Health and other important departments is being done on VMDs.

The Smart Cities Mission, promotes cities that provide core infrastructure and give a decent quality of life to its citizens, and a clean and sustainable environment and application of smart solutions. Such smart solutions include information and communication technology (ICT) interventions for e-governance and online government services for improving the efficiency of core services at a relatively lower cost.

Jal Shakti Mission

"Jal hi jeevan hai" (Water is life).

Water is an essential commodity. The whole world is focusing on the scarcity of potable drinking water. Water stress-related issues are now a serious concern across the country. The government is proposing comprehensive measures for one hundred water stressed districts. Safe water mission with a focused approach (Jal Jeevan Mission) and comprehensive sanitation program (Swachh Bharat Mission) have been launched to support the health vision.

Water Supply: aiming to provide piped water supply to all households. The government has approved Rs. 3.60 lakh crore for this mission. This scheme also places emphasis on augmenting local water sources, recharging existing sources and will promote water harvesting and de-salination. The components of smart water management are:

i. Smart meters & management.

ii. Leakages identification, preventive maintenance.

iii. Water quality monitoring.

Urban Waste Water Reuse: In urban areas, plans/ approvals with time-bound targets to be developed for waste water reuse for industrial and agriculture purposes. Municipalities to pass by-laws for the separation of grey water and blackwater.

Sewage Collection, Treatment and Disposal System: The government is committed to open defecation free (ODF) plan in order to sustain ODF behaviour and to ensure that no one is left behind. Now, more needs to be done towards liquid and grey water management. Focus would also be on solid waste collection, source segregation and processing.

The ministry of Jal Shakti will fulfil the mammoth task of providing functional piped water to all Indian households by 2024. This means 4.5 times more houses have to be linked to piped water in the coming five years than has been done in the past 72 years.

Swachh Bharat Mission

"Sanitation is important than independence"
– Mahatma Gandhi

Gandhi made cleanliness and sanitation an integral part of his life. His dream was total sanitation for all. Cleanliness is most important for physical well-being and a healthy environment. It has bearing on public and personal hygiene, sanitation and the various diseases that are caused due to poor hygienic conditions.

Inspired from Mahatma Gandhi and to accelerate the efforts to achieve universal sanitation coverage and to put focus on sanitation, the Prime Minister launched the Swachh Bharat Mission (SBM) on 2nd October 2014. Under this mission, all villages, gram panchayats, districts, states, and union territories (UTs) in India declared themselves 'open-defecation free (ODF)' by 2nd October 2019, the 150th birth anniversary of Mahatma Gandhi.

The smart solutions for Swachhata in terms of waste management are:

i. Waste to energy & fuel.
ii. Waste to compost.
iii. Waste water to be treated.
iv. Recycling and reduction of CVD waste.

It is important to mention that the Ministry of Railways is the frontrunner of the SBM. Under Swachh Railways, 49,487 bio-toilets were installed in 14,916 coaches during 2019-20. This takes the cumulative numbers of bio-toilets to 2,45,400 fitted in 68,800 coaches with a coverage of about 99.3%. Indian Railways banned single use plastic material on 2nd October 2019.

Atal Mission for Rejuvenation and Urban Transformation (AMRUT)

Providing basic services (e.g. water supply, sewerage, urban transport) to households and build amenities in cities which improve the quality of life for all, especially the poor and the disadvantaged is a national priority.

The initiatives taken earlier have shown that infrastructure creation should have a direct impact on the real needs of people, such as providing taps and toilet connections to all households. This means that the focus should be on infrastructure creation that has a direct link to provision of better services to people.

Therefore, the purpose of Atal Mission for Rejuvenation and Urban Transformation (AMRUT) is to (i) ensure that every household has access to a tap with assured supply of water and a sewerage connection; (ii) increase the amenity value of cities by developing greenery and well-maintained open spaces (e.g. parks); and (iii) reduce pollution by switching to public transport or constructing facilities for non-motorised transport (e.g. walking and cycling). All these outcomes are valued by citizens, particularly women, and indicators and standards have been prescribed by the Ministry of Housing and Urban Affairs (MoHUA) in the form of Service Level Benchmarks (SLBs).

Earlier, the MoHUA used to give project-by-project sanctions. In the AMRUT, this has been replaced by approval of the State Annual Action Plan once a year by the Central Ministry and the States have to give project sanctions and approval at their end. In this way, the AMRUT makes states equal partners in planning and implementation of projects, thus actualising the spirit of cooperative federalism.

Thrust Areas

The Mission will focus on the following thrust areas: (i) water supply, (ii) sewerage facilities and septage management, (iii) storm water drains to reduce flooding, (iv) pedestrian, non-motorised and public transport facilities, parking spaces, and (v) enhancing amenity value of cities by creating and upgrading green spaces, parks and recreation centres, especially for children.

Coverage

Five hundred cities have been taken up under AMRUT. The category of cities that covered in the AMRUT are: (i) All Cities and Towns with a population of over one lakh with notified municipalities, including cantonment boards (Civilian areas), (ii) All capital cities/town of states/UTs, (iii) All cities/towns classified as heritage cities by MoUD under the HRIDAY Scheme, (iv) Thirteen Cities and Towns on the stem of the main rivers with a population above 75,000 and less than 1 lakh, and (v) Ten Cities from

hill states, islands and towns/ destinations (not more than one from each State).

Mission Components

The components of the AMRUT consist of capacity building, reform implementation, water supply, sewerage and septage management, storm water drainage, urban transport and development of green spaces and parks. During the process of planning, the Urban Local Bodies (ULBs) will strive to include some smart features in the physical infrastructure components. The mission components include:

Water Supply

i. Water supply systems including augmentation of existing water supply, water treatment plants and universal metering,

ii. Rehabilitation of old water supply systems, including treatment plants,

iii. Rejuvenation of water bodies specifically for drinking water supply and recharging of ground water and

iv. Special water supply arrangement for difficult areas, hill and coastal cities, including those having water quality problems (e.g. arsenic, fluoride)

Sewerage

i. Decentralised, networked underground sewerage system, including augmentation of existing sewerage systems and sewage treatment plants,

ii. Rehabilitation of old sewerage system and treatment plants, and

iii. Recycling of water for beneficial purposes and reuse of wastewater

Septage

i. Faecal Sludge Management-cleaning, transportation and treatment in a cost-effective manner,

ii. Mechanical and biological cleaning of sewers and septic tanks and recovery of operational cost in full.

Storm Water Drainage

Construction and improvement of drains and storm water drains in order to reduce and eliminate flooding.

Urban Transport

i. Ferry vessels for inland waterways (excluding port/ bay infrastructure) and buses,

ii. Footpaths/walkways, sidewalks, foot over-bridges and facilities for non-motorised transport (e.g. bicycles),

iii. Multi-level parking, and

iv. Bus Rapid Transit System (BRTS).

Green Space and Parks

Development of green space and parks with special provision for children, senior citizens and differently abled-friendly components.

Reforms Management & Support

i. Support structures, activities and funding support for reform implementation,

ii. Independent Reform monitoring agencies.

Capacity Building

i. This has two components- individual and institutional capacity building,

ii. The capacity building will not be limited to the mission cities, but will be extended to other ULBs as well,

iii. Continuation of the Comprehensive Capacity Building Programme (CCBP) after its realignment towards the new Missions.

Fund Allocation

The total central outlay for AMRUT is Rs. 50,000

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crore for five years from FY2015-16 to FY2019-20 and the mission will be operated as a centrally sponsored scheme. The AMRUT may be continued thereafter in the light of an evaluation done by the MoHUA and incorporating learnings in the mission. The mission funds will consist of the following four parts:

i. Project fund: 80% of the annual budgetary allocation.

ii. Incentive for Reforms: 10% of the annual budgetary allocation,

iii. State funds for Administrative & Office Expenses (A&OE): 8% of the annual budgetary allocation, and

iv. MoHUA funds for Administrative & Office Expenses (A&OE): 2% of the annual budgetary allocation.

It is revealed from the data that 46% of water connection and 28.3% of sewer connection targets have been achieved between June 2015 and December 2019. With the under achievement of the set targets for urban renewal in 500 cities, the government decided to extend the mission period of AMRUT by two more years. The mission promises 139 lakh water connections by March 2020, 145 lakh sewer connections, storm water drainage projects, parks and green spaces and LED streetlights with a total outlay of Rs. 77,640 crore (including central assistance of Rs. 35,990). The data also reveals that over the last five years, only 2,316 projects worth Rs. 7,195 crore i.e 9.2% of the total outlay have been completed.

Challenges and Way Forward

There are many challenges related to smart cities such as creating a vast infrastructural set-up with huge investment. Also, the cities must always be prepared for the security and hacking of the entire software systems. In any smart city, there should be a balance between the quality of life and invasion of privacy. A smart city needs smart techno-savvy citizens who may engage actively in taking advantage of new technology. The smart city should always be socially inclusive.

Swachh Bharat Mission- urban area faces two major challenges:

i. Disposal of solid waste and

ii. Sewerage/liquid waste.

Disposal of solid waste has three key components. First, waste collection, then transfer of the waste, and lastly, proper disposal at the landfill site. The task of waste collection and its transfer to the landfill site requires both manpower as well as an efficient transportation system. The segregation of waste can either be at the source or at the landfill. Segregation at source is more economical. At the landfill, it is done by either using high-end segregation plants or manual conveyors. In addition, the cleanliness is primarily related to the behavioural aspect of individual and the society and its success and the continuation of the Swachhata ideology is totally dependent on the behaviour of the people towards cleanliness. Dependent on others for cleanliness will hamper the mission. It is important to mention the efforts of the cleaning staff and their services which they have done during the challenging COVID-19 epidemic. It is our duty to support them to maintain cleanliness by reducing the dependency on them for the swachhata. This determination would be the first step to fight the corona epidemic. ❑

References

1. Promoting Innovative Smart Solutions under Smart Cities Mission, AMRUT and Swachh Bharat Abhiyan, M/o Urban Development, Government of India.
2. Smart City: Mission Statement and Guidelines, M/o Urban Development, Government of India, June 2015.
3. Atal Mission for Rejuvenation and Urban Transformation: Mission Statement & Guidelines, M/o Urban Development, Government of India, June 2015.
4. Smart City Mission: Integrated Command and Control Centre, National Workshop for Project Management Consultants of Smart Cities, M/o Urban Development, Government of India, 30th October 2017.
5. COVID-19 Indian Smart Cities: Leveraging Technology and Smart City Facilities for Rapid Response, Brattle Consulting Group, 12th May 2020.
6. Modification in Some of the Provisions of the Guidelines of AMRUT, OM Letter No. 14011/72/2015-AMRUT-I, dated 1st August 2016, M/o Urban Development, GOI, New Delhi.
7. Guidelines of Swachh Bharat Mission Urban, Revised in 2nd October 2017, M/o Housing and Urban Affairs, Government of India.
8. One year of Modi 2.0: Towards a Self-reliant India, Government of India.
9. https://ubidots.com/blog/the-key-challenges-for-smart-cities/
10. https://www.narendramodi.in/pms-address-to-the-nation-on-COVID-19-related-issues-548414
11. http://jalshakti-ddws.gov.in
12. http://amrut.gov.in
13. http://swachhbharaturban.gov.in
14. Newspaper: The Hindu, Business Standard.
15. https://economictimes.indiatimes.com/news/politics-and-nation/mission-on-urban-renewal-extended-by-2-yrs-to-2022/articleshow/72861874.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst
16. https://www.sundayguardianlive.com/news/sbl-gains-lost-post-urban-lockdown
17. https://ubidots.com/blog/the-key-challenges-for-smart-cities/

Digital Defence against COVID-19

Saurabh Gaur
Richa Rashmi

Coronavirus has created a sense of existential fragility by exposing vulnerabilities of health systems across the globe. In what has become a prolonged struggle for preserving life vs saving livelihoods. Millions have lost their jobs and are staring into an uncertain future. Amidst this crisis, digital technologies have emerged as a savior and helped people to learn, adapt and work-from-home. The virtual world has provided solutions for the real world problems at a scale and pace that has not been encountered earlier.

Digital technology has been at the forefront of fighting the coronavirus pandemic and prevented health systems from becoming overwhelmed. The acceleration into a digital world order in form of telework, e-commerce, telemedicine, online education, digital surveillance etc. has upended governments, corporations and people alike. This has forced the decision makers in both public and private sectors to alter their traditional and legacy bound approaches and align themselves to the new world order that is digital both at the core and the peripheries. Recognizing its far-reaching impact, World Health Organization (WHO) on April 17, 2019, released recommendations for countries to use digital health technology, accessible via mobile phones, tablets and computers, to improve people's health and delivery of essential services. Emerging and innovative quick-to-market solutions have been ideated and deployed by states across the globe. This article collates and examines some of these initiatives that have contributed in the fight against the coronavirus as well as aided rapid recovery and built resilience into institutions and people.

Digital Initiatives

Mobile Applications

As coronavirus wades through international boundaries, public health officials are paying close attention to countries that are flattening the curve, slowing the spread of infection. Coronavirus spreads from infected persons for days before they develop symptoms, and takes even more time for public health investigators to learn about suspected cases and confirm them with their testing protocols. Mobile App based contact tracing has been found to be tremendously useful in identifying potential cases and gathering information about the spread of disease as it saves precious time spent by field health and public safety officials through traditional methods of interviewing the infected person, tracking down all the recent contacts they can recall, and getting those people to self-isolate and test themselves before they pass on the virus. One modeling by infectious disease epidemiologist Christophe Fraser and colleagues at the University of Oxford predicted that if about 56% of the population (or about

Figure 1: Digital Initiatives to Fight COVID-19 Crisis

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40% of all smartphone users) used an app, it alone could reduce the number of those infected from about three (roughly where it was at the start of the epidemic) to below one (the threshold for controlling the outbreak).

Australia was the first to develop COVIDSafe app using a bluetooth signaling protocol that allows health officials to access crucial information about a person's interactions if they contract the virus. Health apps have also been a critical element of China's efforts to prevent a second wave of COVID-19 infections. Chinese residents have been mandated to scan QR codes to share information about their health status and travel history every time they enter a different premise. South Korea's Center for Disease Control and Prevention runs COVID-19 Smart Management System, a contact tracing smartphone app that helps the authorities to analyse the movement of affected patients and those in quarantine. Hong Kong has mandated each new arrival in the region to download the StayHomeSafe app. Some countries have even gone to the extent of giving paired wristbands to those who are put under disease surveillance and thereafter utilise geofencing technology to help catch violators. Apple and Google have partnered to also create contact tracing apps, which are being adopted by public health agencies from Germany and the states of Alabama and South Carolina in US.

India has launched its own Bluetooth and GPS enabled contact tracing app, Aarogya Setu that endeavors to generate information about the health and COVID-19 safety status of an individual as well as his/her precinct. It is a tool for citizen empowerment as it provides an opportunity to self-assess and actively reach out to health system with one's own status of well-being. The use-cases for Aarogya Setu have been expanded to include telemedicine, chatbots, IVRS, e-pass and hotspot management. Aarogya Setu provides for speed and quality in collection of data at the national level and then interception of information at the local level to inform the field level functionaries and assist in their functioning. This curbs mala fide information networks, dispels fear-mongering and helps in managing public sentiments effectively. Multilingual chatbots on the app further overcome language barriers, access information and aids communication.

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Open-sourced Analytics and Modelling Tools

Rapid data sharing is critical during epidemics and pandemics as it allows for a better understanding of the origins and spread of the infection and can serve as a basis for effective prevention, treatment and care. The placement of the first genome of the 2019-nCoV virus, which was the most rapid characterization of a novel pathogen in history, in an open database on 5th January 2020, paved the way for scientists around the world to start working on the development of a treatment or vaccine as it allowed laboratories to develop the necessary diagnostics within a limited timeframe. Making this data open was the first and most important data-sharing initiative that helped scientists to grow the live virus and build up a picture of how the virus is spreading. In fact, the most important initiatives to prevent and monitor the spread of the disease have been based on an ever-growing ecosystem of open science, open-data and open-source platforms that share dashboards, information and resources of vital importance for decision-makers. Open-source technologies can bring to the fore a broader set of important concepts such as accessibility of information, open standards that enable all stakeholders to contribute and rapid prototypes that can lead to rapid discoveries.

Singapore's Government Technology Agency decided to offer the protocol that powers the TraceTogether contact tracing app to the open-source community. The Israeli government recently released the Shield open-

source app, which collects location data from users' phones in an attempt to determine if they might have been exposed to coronavirus. Responding to concerns about the lack of testing components to test for COVID-19, the Just One Giant Lab developed an open-source coronavirus test methodology to share designs so that certified labs could produce test kits easily. NextStrain is an open-source application that tracks the evolution of viruses and bacteria, collects all the data around the world from labs that are sequencing the SARS-CoV-2 genome, and centralises them in one place in the form of a genomic tree.

Maker's Asylum, a community hackerspace in Mumbai and New Delhi, has designed M-19 face shields for healthcare workers that can be made in just about three minutes by anyone following the guidelines of the prototype. Another key innovation has come from a team of biosciences and bioengineering researchers at Indian Institute of Technology, Kanpur, which has developed a full PPE kit that, when mass-produced, would cost less than Rs. 100. The Indian Institute of Science portal consolidates and

presents all its ongoing COVID-19 related projects and invites people with necessary expertise to collaborate with other research teams. Kerala's CovidSafe Network is also working on similar lines with two major components: Corona Literacy Mission to create awareness on COVID-19 and Corona Care Centre for converting educational institutions into hospitals to offset for shortages.

Tele-health Technologies

This pandemic has posed unique challenges to healthcare delivery amidst restricted movements imposed by countries across the world and shutting of non-essential services in the bid to flatten the curve. An essential link between clinicians and patients advocating self-quarantine measures are being adopted through alternative technologies. Telehealth technologies allow patients to be seen and diagnosed remotely by doctors via an audiovisual, real-time, two-way interactive communication system. Given the high transmission rates of the disease, especially within hospitals, telehealth technologies can be a cost-effective means to filter those with moderate symptoms from the severe cases, thus keeping the hospital's carrying capacity off-load. Moreover, since it is available anytime, it can handle more patients than in-person care.

Scores of countries are now providing virtual care on a war footing. Start-ups like General Atlantic-backed Docsalb and insurer Axa-supported Qare in France, Swedish Kry International's unit Livi, the UK's Push Doctor and Germany's Compugroup Medical offer virtual doctors. Telehealth giants such as Amwell and Teladoc are now advertising their availability for coronavirus-related appointments. Meanwhile, Sheba Medical Center, the largest hospital in Israel, launched a remote patient-monitoring program in an attempt to control the spread

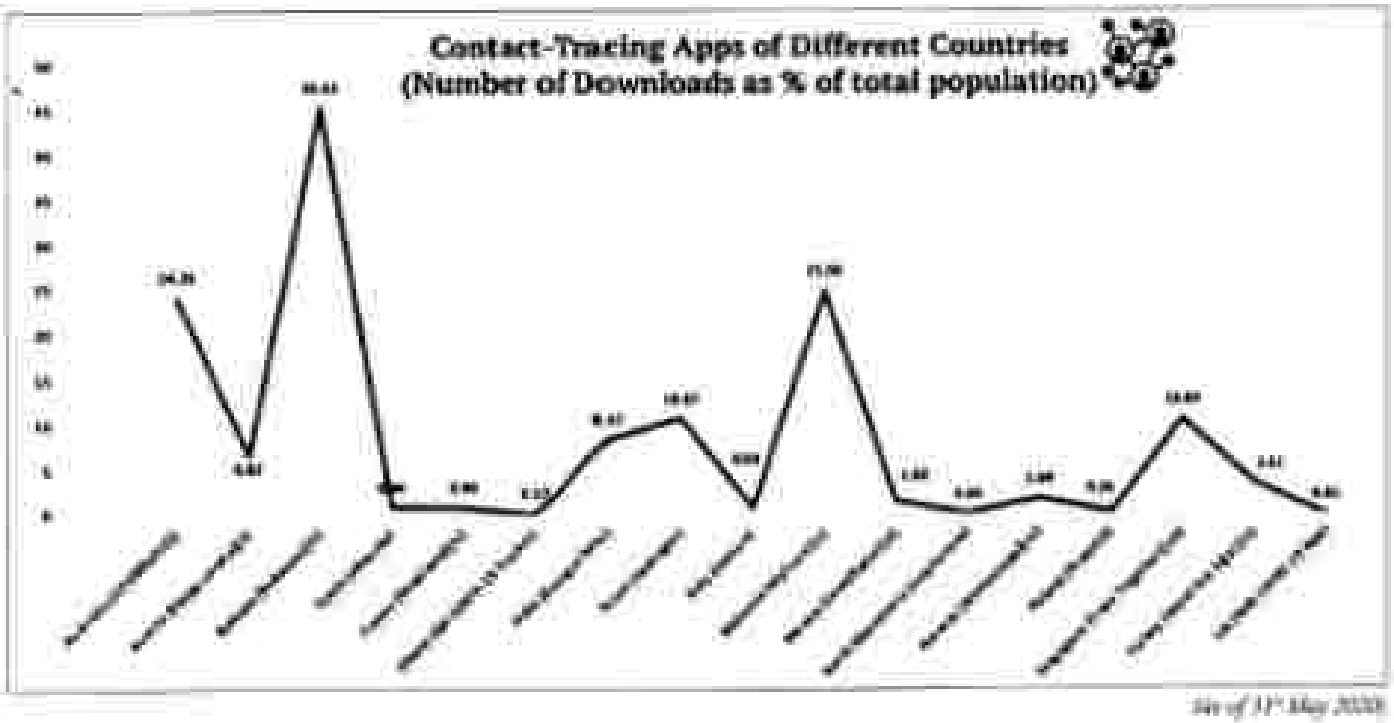

Figure 2: Number of Downloads of Respective Countries' Contact-tracing Mobile Applications Against Total Population

of the virus. Even health insurance companies in US have come to the fore and approved reimbursements for COVID-19 tele-consults.

In India, digital health platforms have partnered to form a platform that brings services for online consultations, home lab-testing (sample collection from home) and e-pharmacy together. E-Sanjeevani is the national telecon sultation service launched by Ministry of Health and Family Welfare (MoHFW) during the COVID-19 pandemic. Along with other online consultation services who have come forward to offer free services to citizens, these have facilitated remote healthcare. The sector has witnessed a dramatic increase in digital healthcare footprint as panic-stricken people reach out to doctors over the mildest of symptoms. To give impetus to such practice, approved registered medical practitioners have been allowed to treat COVID-19 patients remotely. Innovative platforms have emerged in other domains of healthcare and management of diseases such as Diabetes, TB, Skin diseases etc., that are trying to emulate the real-life experience by giving patients the option of adding their regular doctor to the platform. Meanwhile, a plethora of e-pharmacy and home lab-test solutions offer doorstep delivery, so that people don't have to unnecessarily step out and fear the risk of exposure.

Geographic Information System (GIS) and Smart City's Integrated Control and Command Center (ICCC)

The origin of GIS is frequently associated with the work of John Snow in 1854 who mapped the spread of Cholera cases in London by merging physical maps and infographics while adding additional layers such as water sources. This led to the discovery that the Cholera virus was spreading via the water sources instead of the air as previously assumed. Insights such as these can tremendously

India has launched its own Bluetooth and GPS enabled contact tracing app, Aarogya Setu that endeavors to generate information about the health and COVID-19 safety status of an individual as well as his/her precinct. It is a tool for citizen empowerment as it provides an opportunity to self-assess and actively reach out to health system with one's own status of well-being.

improve understanding and hasten corrective actions. Geographic interpretation and insight is essential in detecting, understanding and responding to the pandemic. GIS helps epidemiologists to map disease occurrence against multiple parameters including demographics, environment, geographies and past occurrences to fathom the origin of outbreaks, its spread pattern, velocity and intensity to implement preventive and surveillance measures. Public health agencies, policy makers and administrators need GIS to understand outbreak patterns in real-time to identify at-risk populations and plan targeted intervention such as evaluating available facilities or increasing healthcare capacities.

ESRI's global Disaster Response Program is providing the ArcGIS Hub Coronavirus Response template at no cost through a special initiative. ArcGIS Hub is a framework to build a website to visualise and analyse the crisis in the context of an organisation or community's population and assets. Healthmap developed by Boston Children's Hospital collates data from validated alerts from official sites for surveillance of emerging symptomatic cases. Johns Hopkins University's Center for Systems Science and Engineering (JHUCSSE) is tracking the spread of COVID-19 in near real time with a map-centric dashboard using ArcGIS Online that pulls relevant data from the WHO, US Centers for Disease Control and Prevention, European Centre for Disease Prevention and Control, etc. WHO unveiled its ArcGIS Operations Dashboard for COVID-19, which maps coronavirus cases and total number of deaths by country, with informational panels about the map and its data.

In India too, GIS has been extensively deployed to fight the pandemic. A GIS platform has been developed by an eminent team of researchers in IIT Chennai and integrated with Aarogya Setu to provide extremely important information about the spread of coronavirus. It is able to predict with great accuracy about the potential hotspots and issue advance warning to public health officials to restrict movement, control activities and prepare health facilities. Kerala has used GIS Mapping and route charting of positive cases by collating disease surveillance data separately, with primary and secondary contacts of confirmed patients traced and identified on a live geo-map. This allows officials to identify high-risk zones to activate containment measures. Telangana government has developed an app, TSCOP.com grouping houses of foreign returnees and also deployed geo-location technology to track people under home-quarantine. Integrated Command and Control Centers (ICCC) across 45 smart cities have transformed into war rooms for operations to contain the spread of the COVID-19. Smart Cities like Pune, Surat, Bengaluru and Yamakuru are using the integrated data dashboards to provide up-to-date information about the status of disease spread and measures taken in different administrative areas of their cities. ICCC are being used to carry out CCTV surveillance of public places, GIS mapping of COVID-19 positive cases, GPS tracking of healthcare

workers, predictive analytics (heat maps) for virus containment across various zones of the city, virtual training to doctors and healthcare professionals, real-time tracking of ambulances and disinfection services, medical services through video conferencing, telecounseling and tele-medicine.

Drones

From disinfection and street patrols to food and medicine delivery in quarantined districts and containment zones, drones are being deployed on the front line to contain the spread of the novel coronavirus. Drones have been effectively used to facilitate aerial broadcasting, to spray disinfectant, conduct aerial thermal-sensing, monitor traffic and deliver medical supplies in infected areas.

South Korea has deployed them to help disinfect areas in Daegu, an epidemic hotspot. Indian cities have also effectively deployed drones to disinfect over-congested slums and colonies. Moreover, police in various states have made effective use of drones to expand surveillance and make live announcements. To this effect, Ministry of Civil Aviation has launched GARUD portal to fast-track conditional exemptions given to government agencies for COVID-19 related Remotely Piloted Aircraft System or drone operations. While city authorities have made good use of drones to enforce lockdown rules, drone makers have used this opportunity to develop and integrate more sophisticated functions like detecting temperature, heart and respiratory rates, and/or detecting people sneezing and coughing in crowds.

A community hackerspace in Mumbai and New Delhi, has designed M-19 face shields for healthcare workers that can be made in just about three minutes by anyone following the guidelines of the prototype. Indian Institute of Technology, Kanpur has developed a full PPE kit that, when mass-produced, would cost less than Rs. 100.

Robots

Robots have been used by many countries to provide services and care for those quarantined or practicing social distancing. Robotics developers have responded quickly to public health concerns raised during the pandemic. Beyond the efficient completion of dirty, dangerous and dull tasks, robots are also being used to minimise human contact and exposure to the virus, and to make hospitals safer for front-line healthcare workers by reducing the risk of clinical staff contracting and spreading COVID-19.

Los Angeles-based Dimer UVC Innovations, has developed germ-killing robot 'GermFalcon' which can be used for sanitising airplanes. It has offered to provide its services to Los Angeles International Airport, San Francisco International Airport and John F. Kennedy International Airport as part of their emergency response efforts. Belgium has used video-conferencing bots by ZoraBots at nursing homes to help the elderly stay in touch with kins.

Robots are increasingly being adopted by India as well. Chennai's Propeller Technologies unveiled Zafi Medic robots at Muthumra Gandhi Memorial Government Hospital that are equipped to deliver food and medicines to COVID-19 patients under quarantine. Humanoids like Sayabot are being used in Kerala to raise awareness and automate sanitisation processes. Incubated in Kerala Startup Mission, Asimov Robotics has debuted its KARMI-Bot that gives semi-autonomous care in quarantine wards in addition to other stated features and also has a supplementary feature of being able to disinfect the hospital premises using ultra-violet radiation.

Three-dimensional (3D) Printing

3D printing technology has existed for quite some time but its popularity has seen a steady rise in recent years, especially in healthcare, aerospace and automotive sectors where they are used to create prototypes. 3D printing can play an important role as a disruptive digital manufacturing technology by boosting production and optimising the supply of specialised and critical medical equipments to treat COVID-19 patients. Given its accessibility, tangible design and flexibility, 3D printing becomes invaluable when the supply chains of

critical products are strained during pandemic.

As the crisis played out in Italy and there was an acute shortage of ventilators, 3D-printed splitters were developed as an attachment, for the exhalation outlet of the ventilator to split and regulate the oxygen supply to multiple patients. 3D manufacturers around the world are developing 3D-printed face shields, inspired by the 3D printed N95 mask designed to filter out airborne particles that could carry the virus. A New York hospital, Northwell Health, is currently 3D printing around 2000 to 3000 nasal swabs a day for immediate use on the front line of this pandemic.

3D technologies are being used in India as well. HP India responded to the critical need of making ventilators available in large numbers by getting over 1.2 lakh key ventilator parts printed in a short span of time. Boson Machines has delivered more than 12,000 3D-printed face shields in various hospitals of Mumbai. Bengaluru-based Hacktura Screens, that makes custom screens for the country's leading multiplexes, has taken to 3D printing face shields, along with PVC aprons and curtains for doctors and quarantine centers, which can be sprayed with sanitiser and quickly disinfected. As part

In India, digital health platforms have partnered to form a platform that brings services for online consultations, home lab-testing (sample collection from home) and e-pharmacy together. E-Sanjeevani is the national telecomultation service launched by Ministry of Health and Family Welfare (MoHFW) during the COVID-19 pandemic.

of Dassault's open innovation and startup accelerator program, the 3DExperience Lab, Inalitas created rapid prototyping system that can create 100 ventilators in 15 days. Defense Research and Development Organization (DRDO) is now working with the private sector to mass produce ventilators and provide high grade protective material for use by researchers and healthcare professionals, and vital enzymes that are needed to make test kits for the virus.

Conclusion

The pandemic has revealed the greater need for affordable healthcare with adequate coverage and inclusive social security for all. Digital technologies that augment knowledge collaborations and promote efficiency, equity and transparency are establishing themselves as cornerstone for all spheres of human activity. Effective cross-government-business partnerships by dissemination of technologies, sharing of expertise, establishment of risk-based models, and revamping procedures in consultation with stakeholders can support governments in restarting economy, restoring livelihoods and rebuilding societies. As the pandemic's prolonged existence necessitates looking beyond short-term measures, it is time for structural and legal frameworks around increased digitization to be firmly entrenched in national economy. Government as well as enterprises will have to dive deep into the future of work as remote working across sectors is set to become the new norm. The shift to virtual operations demands not only an accelerated pace of metabolic learning but also scaling up analytics and quality. Innovation has to be both at speed and scale and that is the key to 'survival of the fittest'.

Views expressed are personal. The article does not endorse any entity or organization that has been referred or attributed. ❑

Technology and Learning

Dr Abhay Kumar

The way technology is being used in education, a new discipline, called educational technology (ET) has emerged. Given the huge gap in access to ICT infrastructure in the country, any technology mediated solutions must first seek to bridge the digital divide. Innovations in technology should move in this direction.

Four revolutions in education have been identified by Eric Ashby (1967)[1]. The first one was when the concept of work emerged within human society and a new and separate job role in form of teaching evolved. Human beings started sending their offspring to teachers for learning. The second revolution happened when written words replaced oral traditions. Print brought the third revolution when mass production of books could become a possibility creating a new culture of reading and writing in the society. The fourth revolution, according to Eric Ashby, was the development in electronics, notably those involving the radio, television, tape recorder and computer. In the same vein, use of digital technology in education brought the fifth revolution with immense possibilities in ways education can be imparted.

The way technology is being used in education, a new discipline, called educational technology (ET) has emerged. Several people have attempted to define it in various ways. The discipline has evolved to be so vast and diverse that each such attempt to define a semantic or term result into missing one or two important aspects of the ET. However, one aspect, which is common in all definitions, is the learning. When we use technology in education, technology as such is not as important as the learning of the students. Use of technology must necessarily result into the enhancement of learning. So, it can be said that the educational technology is the efficient way of organising learning. And in this sense, processes and artefacts both become important. We look to use technology in the context of educational scenarios in India having a large number of students learning in a variety of schools. Table 1 highlights the enrolment in schools in India.

Recent Initiatives in Education

SWAYAM Prabha, which consists of a bouquet of 32 DTH educational TV channels, was launched on 9th July 2017 in New Delhi. The purpose of this initiative was to telecast high-quality educational programs round the clock. Of all the technological initiatives taken for school education thus, SWAYAM Prabha has emerged as the most crucial initiative of the government in meeting the challenges of reaching out to a large number of students during the COVID-19 pandemic.

Access to ICT infrastructure is not adequate in the country. According to NSS 75th round, only

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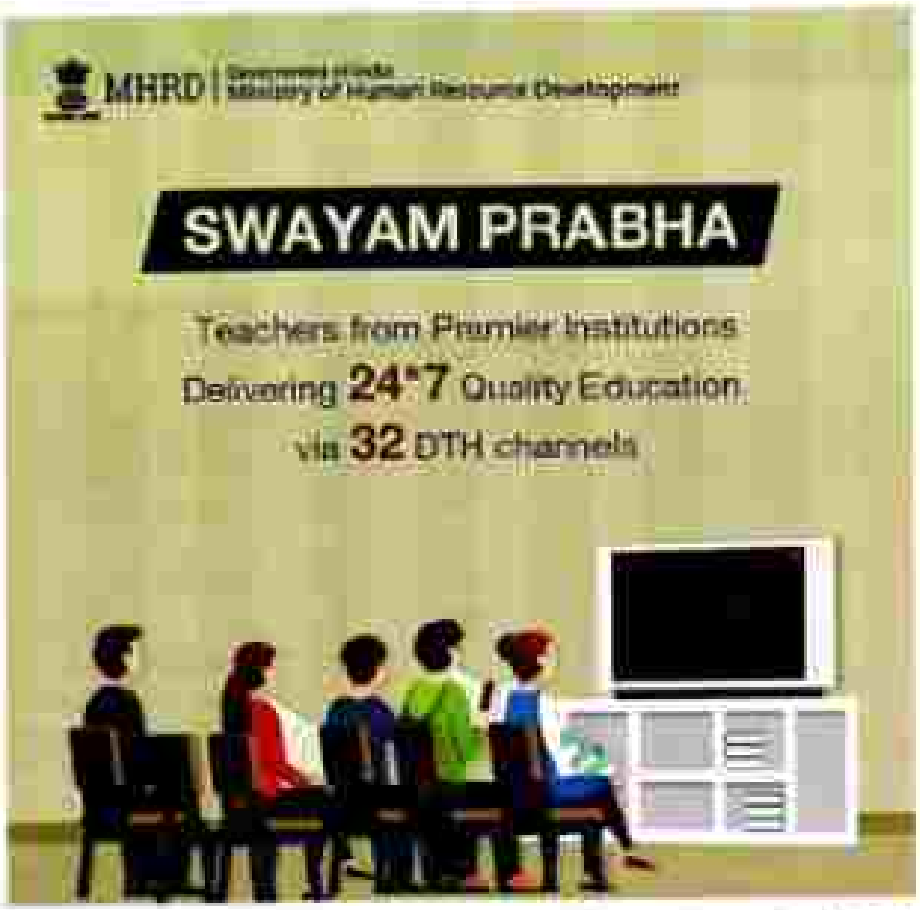

10.7% of the households in the country (both rural and urban combined) had computer, while 23.8% of households had internet connection. Clearly, any initiative which was dependent upon internet and computers for reaching out to students during the lockdown was had severe limitations. TV and radio have far better presence among the households in India. Therefore, government moved swiftly to rope in private service providers to bring in these channels (especially those related to school education, viz., those run by NCERT and NIOS) across their platforms. Now, all cable TV operators and all DTH TV service providers including the private ones are showing them.

Considering the success of SWAYAM Prabha channels and the fact that they have a large catchment area, the government has decided to start 12 educational TV channels on DD platforms for classes, dedicating one channel for each class. Presently, out of 32 channels under SWAYAM Prabha, channels 01-10 are managed by CEC-UGC, New Delhi; channels 11-18 are managed by NPTEL (National Programme on Technology Enhanced Learning, an initiative funded by the Ministry of Human Resource and Development, Government of India and coordinated by IIT Madras and other IITs); channels 19-22 are managed for high school students by IIT Delhi and is called IIT PAL (Professor Assisted Learning an initiative of IIT Delhi and is meant for helping students to crack the Joint Entrance Exam [JEE]); channels 23-26 are managed by IGNOU; channels 27-29 and 36 by NIOS, channel 29 by UGC-INFLIBNET; channel 31 by NCERT and channel 32 by IGNOU and NIOS together.

> **Radio has even greater reach among the people. In comparison to TV, accessing radio is cheaper, less cumbersome and requires less recurring costs in its operations. Radio sets are also useful for a section of children with special needs (CWSN). Those students who have vision-related difficulties can learn using radio. Radio is also useful for learning languages.**

Radio has even greater reach among the people. In comparison to TV, accessing radio is cheaper, less cumbersome and requires less recurring costs in its operations. India is a large country with an uneven

Table 1. School Education in Numbers

Level	Enrolment (in thousands)			No. of Schools	No. of Teachers	No. of Schools by the Types of Management
	Male	Female	Total			
Primary (I-V)	66873	62250	129123	840546	2606120	Govt. - 1102783 Govt. Aided - 83787 Private Unaided - 335776
Upper Primary (VI-VIII)	34720	32874	67594	420624	2612347	
Secondary (IX-X)	20547	18598	39145	159339	1431591	
Senior Secondary (XI-XII)	13002	11733	24735	102637	2041864	
Total	135142	125455	260597	1522346	8691922	1522346

Source: Educational Statistics at a glance by MHRD, Government of India, 2019

development. There are places where electricity is not available round the clock. Radio sets therefore become useful. They are also useful for a section of children with special needs (CWSN). Those students who have vision-related difficulties can learn using radio. Radio is also useful for learning language. Therefore, the government is promoting the use of radio in learning. Community radio and radio streaming on internet (podcasts) have emerged as viable technological solutions for reaching out to hitherto unreached students and teachers in the country.

Similarly, SWAYAM became handy during the lockdown, where several school courses offered by NCERT were made available to students. SWAYAM, an acronym for Study Webs of Active-Learning for Young Aspiring Minds, is an online digital platform which hosts several courses offered by the best teachers of universities/ colleges/schools free of cost to the students living in any part of the country. One needs to pay only for examinations and certificates. Such courses are also known as Massive Open Online Courses (MOOCs). It's massive because any number of students can join in any course and there are courses which have been joined by thousands of students. Courses on SWAYAM (swayam.gov.in) follow 4 quadrants approach, viz., text, videos, assessment and discussion forum. University Grants Commission (UGC) has made provisions for transferring credits for the courses offered on SWAYAM. When educational institutions are closed, such options made possible by the application of technology are useful to students and teachers alike. Teachers too can join any course of their liking which can help their grow professionally.

In 2015, NCERT and MHRD, Govt launched ePathshala (epathshala.nic.in) portal and mobile app (for all three mobile platforms, viz., android, windows, iOS). This app and portal hosts all text book titles of NCERT as ePubs and flipbooks. There are number of eContents to help students learn concepts better. All these resources are freely available. Like the SWAYAM Prabha initiative, ePathshala too became useful in the present times. Students going to new classes could access the new books

SWAYAM, an acronym for Study Webs of Active-Learning for Young Aspiring Minds, is an online digital platform which hosts several courses offered by the best teachers of universities/ colleges/schools free of cost to the students living in any part of the country.

Technology driven Systems – Online Education during COVID

- SWAYAM PRABHA DTH channels to support and reach those who do not have access to the internet. 3 channels were already earmarked for school education; now another 12 channels to be added.
- Provision made for telecast of live interactive sessions on these channels with experts from home through Skype.
- Also tied up with private DTH operators like Tata Sky & Airtel to air educational video content to enhance the reach of these channels.
- Coordination with States of India to share air time (4 hrs daily) on the SWAYAM PRABHA channels to telecast their education related contents.
- DIKSHA platform has 61 crore hits since 24th March 2020.
- 200 new textbooks added to ePathshala.

freely through this app/portal. There are other e-contents (more than 3000) audio/video materials) available on this app. All these resources are freely available. More than 63 million users have accessed the contents on web portal of ePathshala while about 3 million users have accessed these contents through app. The features of this app/portal can be further diversified to make it a school in virtual world.

The Government's push for "One Nation, One Digital Platform for Learning" has resulted into the creation of Digital Infrastructure for Knowledge Sharing (DIKSHA). The DIKSHA app was launched in 2017. Although it's just one app for the entire country, it seeks to decentralise the creation of eContents by encouraging teachers and teacher education to develop new and innovative programs which help in the learning of children and teachers. The eContents are first evaluated and vetted and then uploaded on DIKSHA platform. It has seven verticals. They are: i) teacher profile and registry, ii) teaching and learning content, iii) content creation platform, iv) teacher professional development, v) school leadership development, vi) assessment and vii) innovation and innovative pedagogy.

The Government's push for "One Nation, One Digital Platform for Learning" has resulted into the creation of Digital Infrastructure for Knowledge Sharing (DIKSHA). It seeks to decentralise the creation of eContents by encouraging teachers and teacher educators to develop new and innovative programs which help in the learning of children and teachers.

Given the huge gap in access to ICT infrastructure in the country, any technology mediated solutions must first seek to bridge the digital divide. Innovations in technology should move in this direction. However, when the pandemic has struck and schools and colleges are closed, we must utilise all our resources at our disposal to ensure that learning happens to children as seamless as possible. The draft National Education Policy (NEP) 2019 identifies a few important concerns related to technology integration in education in the country. One such concern is the availability of the local expertise in resolving and maintaining hardware and software at remote locations. As such, it recommends deploying local talents for managing technological issues in schools. In this way, technology use in education has ramifications for the employment at the local level too. ❑

Endnote

- Ashby, Eric: "Machines, Understanding and Learning: Reflections on Technology in Education", The Caribbean Journal, vol. 1, no. 2, Spain, Jan., 1967.

Satyajit Ray's Films: Deconstruction of Men and Masculinities

Dr Debjani Halder

"Fundamentally Indian cinema is a hero-dominated discourse, where the clear psychological conflicts between oppositional forces like the good (hero) and evil (bad) always extend through the narratives. In the context of early Indian cinema, the hero represented as a masculine archetypal image. In mainstream films, the hero is depicted as mystique images, which scaled to the star ladder. But it was in the 1950s when parallel film movement just began its journey; Satyajit Ray was one of them who tried to deconstruct the images of hero. His protagonists were characterised as emasculated vanquisher their crisis was derived from the contemporary socio-economic-political vortex. They depicted as more real, ordinary common..." – (Bengal Shyam: 2019)

Representation of the hero in popular Indian cinema is more or less stereotypical. It is a global phenomenon that stars, especially the hero, is the most noticeable insignia of the popular culture which recognisably compresses the icons of time-space and has the foremost effects on geopolitics. The fascination with stardom and ceaseless machinery of celestial production both attached to the power of the platform of media outlets. Since the investors of popular Indian cinema always deal with market value and considered film as part of the business, so they always look for a charismatic, romantic, masculine image of the hero. In the colonial period, when the superiority of Victorian manliness indicated Indian man as effeminate, then as a result of masculine anxiety, Indians, especially *Bengali Bhadralok* (writers, poets, and filmmakers) developed the iconic heroic male figures as the counterpart of Indian effeminacy. In the early phase of Indian cinema, a hero portrayed from the Nationalist-Brahmanic icon.

In the 1950s when the parallel film movement had taken place in India and film-makers experimented with the concept, forms, and techniques, they tried to represent the parallel images of the male protagonists. They were not specialised as male mystique. The placebo presence and humour of the crowds in mainstream cinema like unemployed youth, factory workers, taxi drivers, coolies, dock-workers, those who were always considered as part of the marginalised masculinities, they came forward from margin to centre of the script of the parallel cinema. Satyajit Ray was one of the pioneers who opened up a new avenue of filmmaking, by representing men and masculinities as non-monolithic, but diverse and plural. Here, I would like to discuss the article in two parts:

1. The depiction of unemployed hero (the socio-psychological crisis of masculinities in terms of unemployment.)
2. Nayak: The Crafted Study of the hero's mind.

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Mahanagar (1963)

1. Mahanagar (1963) to Jana Aranya (1974): The Depiction of Unemployed-Vanquish Hero

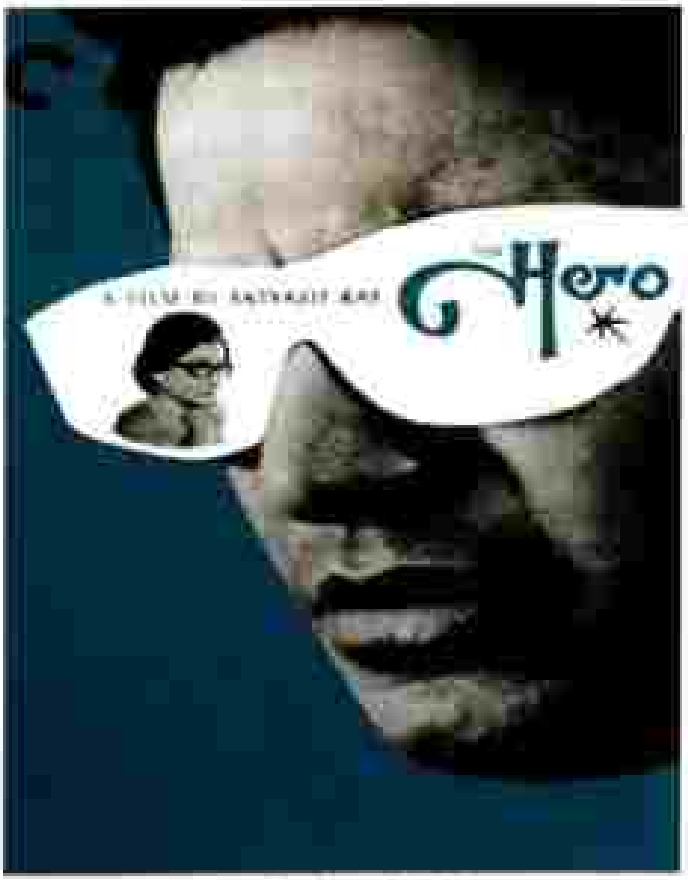
Patriarchy creates and consolidates male power in both the public and private domains. In a very large way, masculinity perceived and possessed inferiority and subordination over women. Patriarchy determines the dynamism of power between men-women. Based on power relations, it specifies the subversion of gender roles and creates a binary of performance too. Patriarchy appreciates male's relationship to the public sphere, especially at work-place, where he not only gets economic independence but also it has given him a social recognition, dominance and superior identities in both the 'Bahir' (public) and Ghar (private) spheres.

Perhaps Satyajit Ray's *Mahanagar* (1963), *Pratidwandi* (1970), and *Jana Aranya* (1975) are most radical narratives, where Ray's perennial concern was to specify three major psychological adjustments of unemployed people. Satyajit Ray depicted unemployment as the social catastrophe and he analysed it as the practice of insecurity which might be dealt with an individual's mind and personality as the loss of self-confidence, feeling of being unwanted and useless, rebellion alternating with apathy, in extreme cases permanent harm to the personality structure. Ray's objective was to explore that in the ground of economic crisis, how the public-private binaries and power relations had been changed. In *Mahanagar (1963)*, Ray depicted the crisis in masculinity as a result of a regressive phenomenon of the emasculation of the public and the feminisation of private, where tradition was powerfully invoked to restructure family and sexuality. Satyajit Ray articulated through the character Subrata, that the greatest fear of man was the failure of not remaining up or not being a "real man".

In the film *Mahanagar (1963)*, Ray not only criticised the traditional performance of man, but also he depicted the binaries between the social conservation and the fate of modernity. Ray depicted that the unemployment therefore not only altered what the protagonist Subrata served for maintaining the family, but it also challenged his masculine identity. When an ordinary bank clerk, Subrata had no job, he lost a degree of control over his own ability to go out or to accomplish his basic needs when he wanted. His partner Arati got a job in sales, she would be seen to have a power that Subrata had lost. Ray depicted that the autonomy to move as a free and independent agent in the public sphere outside the home and the job is heavily gendered, and some contestation between men and women always foregrounded. Here in the film '*Mahanagar*' (1963), Ray depicted that the participation of Arati in the public sphere and her determination to cross the gender boundary indicated unemployed Subrata's insecurity about his masculine identity. The close relationship between the discourses of public masculinity and domestic provision is illustrated particularly well by the scenario that was recounted by Subrata and how unemployment created a tension between a domestic provision in the home and feelings of the inability of a 'real man', since he failed to put his family first in a situation of limited resources and discovered his wife Arati no longer needs financial support from her husband. Ray outlined that it was the common phenomenon of patriarchy while men have a negative attitude towards women's labour in a public domain. Subrata though tried to withdraw his stereotypical views about the traditional roles and expectations of women's performance, nonetheless his overprotective nature, result created an extra burden for Arati who tried to make a balance between public-private.

It came out in *Amrita bazar Patrika* (12.11.1974) that 28,244 people applied for the post of clerks in a bank. The applicants include 300 degrees and diploma holder engineers, numerous postgraduates in science and arts and 12,000 graduates. Unemployment among educated was depicted in industry to provide the facilities to millions of degree holders.

Pratidwandi (1970)



Pratidwandi (1970)

In the film, *Pratidwandi* (1970) and *Jana Aranya* (1976), Ray portrayed that numbers of educated unemployed increased during the first half of 1969. He examined that it was not easy to determine empirically a person's actual "disposition to work," especially if one also wanted to get the conditions under which he was disposed to take a job. He depicted in the film *Pratidwandi* (1970) that since the problem of unemployment had synchronised with the highly inflationary phase of the economy, and public work was going down in a deflationary phase, so the medical student protagonist Siddhartha was ready to receive any sort of job because he was the elder son of the family. It was the medium to regain his dignity. Throughout the film, Ray depicted Siddartha as the vanquisher by his entrapment in the city and the house, continually absconding into his inner space. Ray visualised the space as a purposely created imaginary site into which Siddartha could withdraw to reinforce and reiterate his desire to abandon the familiar, which revolves around his home and the urban world of Calcutta. Ray intricately condenses his adversary's predicament by shooting over Siddartha's shoulder as he urgently pounds the pavements of his city looking for a job. The site of a humanised camera not only submerges Siddartha in overcrowded Calcutta but ironically also sharply pulls him back so that relief comes only when the real is substituted by the imaginary.

Director Shyam Benegal has stated that, "In Ray's *Mahanagar, Pratidwandi, Jana Aranya, Akash Kusum*, not only tried to locate the complex relationship between long-term unemployment and dominant forms of masculinities within heterosexual relationships but also he explored as well as prolonged, the crisis what unemployment brings. It is his credit that he tried to bring a psychological explanation where the frustration, loneliness, resignation, low self-esteem and rage have been articulated..." (Benegal: 2019).

2. Nayak: The Crafted Study of Hero's mind

I introduced my article, with the conception that the Indian mainstream cinema depicts the hero and masculinity from a specific dimension. For example, Rajesh Khanna was the first male superstar and who was always visualised at the centre of a magic accident or incident. During the 1970s and the 1980s, followed by Amitabh Bachchan, Rajni Kant, Shatrughan Sinha they were depicted as 'vigilante' hero and popularised for their 'angry-young-man' images. In the aspect of the mainstream cinema, the male body is an asset of masculinity, and the body depicted as a constellation of narratives, so the macho hero always actualised as artifacts and objects, rather than the human body. The thinkers like Walter Benjamin to Walter Ong (1982), Martin Jay to Jean Baudrillard (1983), have given an example of various models of historical changes, where the body depicted as a strong medium. I would like to discuss Satyajit Ray's 'Nayak' (1966) where he criticised the stardom, in the sphere of the technological sublime and a mystical union of spirit and power. In the film, Ray was introducing the average middle-class viewer to the human self that lay behind the portico of a star.

In the introduction of the film, Ray depicted that Arindam, a star of popular Bengali Cinema, who achieved stardom in a fairly quick time. Arindam decided to take a train journey with upper-middle-class passengers of the kind likely to constitute his audiences and for whom he has great disregard. Ray's main objective of making this film was to depict the isolation of stardom from social reality and a sense of emptiness that erupts in violent outbursts. As the co-passenger

In the 1950s when the parallel film movement had taken place in India and film-makers experimented with the concept, forms, and techniques. They tried to represent the parallel images of the male protagonists. They were not speculated as male mystique. Satyajit Ray was one of the pioneers who opened up a new avenue of filmmaking, by representing men and masculinities as not monolithic, but diverse and plural.

of Arindam's journey. Ray depicted the character Aditi, a journalist as the mirror effect of the hero, who always revealed to Arindam from an archetypal hero to a common flesh blooded. Articulating the dialogue by Aditi "the lack of connection with reality/ *Vastavikhar Abhaav*," Ray depicted the truth that in the context of the popular mainstream cinema, hero gradually distancied from social reality. The hero kept from being identifiable with any one cultural or psychological theme or type. They framed as the residual category in the universe of the myth. Melodrama seems to be an ethical order enacted out of the conflict of polar opposites - a struggle between good and evil, personified in the conflicts of the hero and the villain, where conflict mainly depicted as the premise of a recognizable socially constructed world.

Articulating the conversation between the hero Arindam and Aditi that "We inhabit the world of shadows so our reality should not be exhibited to the public... we want to be a hero to the public eyes..." Ray depicted the truth that the audience is 'iconophilic' and the cult of hero-worship naturally transposed itself to actors of popular cinema. The public transferred its aspirations and nostalgia to the stars that, in their eyes, were the worthy objects of admiration and imitation. In the film, '*Nayak*' Ray tried to depict the conflict, dreams, aspirations, tragedies, revenge, desires of the hero on screen, which was not archetypal, but a very common instinct of human behaviour. Simultaneously, Ray also revealed the sense of narcissism among hero, the egocentricity and rampant individualism of modern culture. He depicted that may be Arindam relished his stardom, but the sense of narcissism consequences and correlates of a deep sense of emptiness. In *Nayak*, Arindam's narcissism characterised in terms of a mirror function. Also, Ray depicted that the intensity of emotions while trauma produces a means of escape. In a dream sequence Ray envisaged, that the subconscious has a symbolic language. In the sequence, of '*Nayak*' the scream of Arindam '*Shekhar Da Please Save Me*' explored the forces of darkness, that become visible through the convulsion produced in the body, and forces of death that may awaken. The scene proclaimed as 'life screams at death'. The scream concentrates all these forces into one action, an action that is the sign of the struggle.

Nayak: Life Screams at Death

Satyajit Ray's Mahanagar (1963), Pratidwandi (1970), and Jana Aranya (1975) are most radical narratives; where Ray's perennial concern was to specify three major psychological adjustments of unemployed people. Satyajit Ray depicted unemployment as the social catastrophe and he analysed it as the practice of insecurity which might be dealt with an individual's mind and personality as the loss of self-confidence, feeling of being unwanted and useless, rebellion alternating with apathy, in extreme cases permanent harm to the personality structure.

Director Satyajit Ray criticised the masculinity and construction of a star, especially those who act as male leads in the popular films that do not only depend on the on-screen image projection. The off-screen deliberation, based mostly on everything that gets published in film magazines, gossip columns, popular press matter equally. In a way, the masculinity construction of a star and its representation is heavily dependent on his off-screen projections which appear in the press in the form of interviews, reports, gossips, comments, rumours, scandals, sometimes fuelled by what can be termed as 'yellow journalistic mechanisms'. It is the significance of '*Nayak*' (1966), that in the film, Ray revealed the emptiness inherent in a lot of mainstream Indian cinema of the late 1960s, seen as a medium of escape for viewers and an easy way to move up the ladder for actors, it was devoid of a social core, of the kind present in the cinema of the 50s. Protagonist Arindam is willing to grab his chance to graduate from stage to screen but doesn't want to help struggling actors do the same. He is willing to anonymously help a friend fund his political movement but is averse to getting involved in politics himself. If his cinema lacks reality, his real-life lacks an intellectual core.

Ray wanted to present Uttam Kumar not as an actor but as a phenomenon. However, while doing so, he also wanted the viewers to see the human side of the lead character, Arindam, a star. Ray was driven by a desire first to investigate the psychology of a star, secondly the psychology of his adulators and detractors, and lastly, to make a film about a man journey. The curious eyes of Aditi, an empathetic journalist, provide the right window to investigate Arindam's psychology. And, as if to tell the viewers that her purpose is fulfilled just by getting to know Arindam rather than writing about him, Ray makes her destroy the notes she has taken down for a print interview. She will retain memories of the journey, but not want to write on it. ❑

iFLOWS: Flood Warning System

iFLOWS, a state-of-the-art Integrated Flood Warning System will help make Mumbai become more resilient, by providing early warning for flooding especially during high rainfall events and cyclones. Using this, it will be possible to have an estimate of the flood inundation 3 days in advance, along with 3 hours–6 hours Nowcast (immediate weather updates). It will be very useful, especially if people need to be evacuated from low-lying areas as we will be able to forecast 72 hours in advance that a particular spot may get flooded. The system will also forecast the rainfall in each pocket.

How the Prediction System Works?

The sophisticated system has been developed by the Ministry of Earth Sciences using its in-house expertise, in close collaboration with the Municipal Corporation of Greater Mumbai (BMC). The system uses rain gauge data and local data such as data on land use, land topographies, drainage systems, water bodies in the city, tide levels, infrastructure and population, which has been provided by BMC. Using these as inputs, the prediction system models weather, rainfall, runoff and water movement, tide and storm surge impacts based on which early Flood Warnings for the city will be provided. It will address the flood inundation due to rainfall, river bank breach, storm surge, obstruction of flow due to roads, buildings, rail lines, high tides and sea level rise.

iFLOWS is built on a modular structure and comprises seven modules. The Data Assimilation Module gathers a

iFLOWS-MUMBAI

INTEGRATED FLOOD WARNING SYSTEM FOR MUMBAI

A MoES Initiative Towards A Disaster Resilient India

variety of dynamic data including IMD weather forecasts and under-water depth of rivers and lakes across Mumbai city. The Inundation Module will use the data to forecast flood inundation 3 days in advance, while the Flood Module will predict how the water will move across areas expected to be flooded. The Vulnerability and Risk Modules, which together comprise the Decision Support System, enables the administration to take smart decisions to manage the situation based on a scientific and holistic assessment of flooding risks. The Dissemination Module makes information available to field officials through various communication channels, enabling them to take prompt and informed field action.

How it Came About?

Mumbai, the state capital of Maharashtra, a megapolis and the financial capital of India has been facing floods with increased periodicity which brings the city to a standstill in spite of its natural and storm water drainage systems. In a bid to aid in the mitigation of the flood prone city, Disaster Management Department of Municipal Corporation of Greater Mumbai (MCGM) approached the Ministry of Earth Sciences (MoES) to develop an Integrated Flood Warning System for Mumbai, on the lines of a similar system developed for Chennai earlier. MoES initiated the development of the flood warning system in July 2019 using the expertise of Indian Meteorological Department (IMD), National Centre for Medium Range Weather Forecasting (NCMRWF), Indian Institute of Tropical Meteorology (IITM) and National Centre for Coastal Research (NCCR), in close coordination with Disaster Management Department of MCGM.

- Floods to be estimated 3 days in advance, at ward level.
- Decision Support System will enable smart decision-making and field action based on risk assessment. ❑

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