YOJANA

HEALTH & ENVIRONMENT

LEAD ARTICLE

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FOCUS

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Van Dhan Yojana: Benefiting the Tribal Livelihoods

As a part of "Sankalp se Siddhi" - Village & Digital Connect Drive, teams (comprising officials from TRIFED and State Implementation Agencies/Mentoring Agencies/Partners) have been visiting villages to activate and understand the status of Van Dhan Vikas Kendras. The visits are taking place across the country and have helped Team TRIFED to oversee the ground-level implementation of the Van Dhan Vikas Kendras.

A state where the implementation of the Van Dhan Yojana is gaining quick ground is Odisha. With 660 Van Dhan Vikas Kendras, subsumed into 22 Van Dhan Vikas Kendra Clusters, more than 6300 tribals are being positively impacted in the state.

Over the past few months, training, procurement of machinery required for processing, branding and packaging has been going on in these clusters which are spread across the state in Mayurbhanj, Keonjhar, Rayagada, Sundargarh and Koraput. Production and processing of raw materials by the tribals has commenced earlier this month.

In Mayurbhanj district, tribal beneficiaries in three clusters, Luguburu VDVKC, MaaDharithri VDVKC and Bhimakund VDVKC will work on processing sal leaf, sal seeds, kusum seeds and wild honey to produce plates, cups made of sal leaves, kusum oil and processed honey. In Keonjhar district, tribal beneficiaries of the Anchalika Khandadhar VDVKC will process raw mango, mustard and turmeric into Aampapad, mango pickle, turmeric powder and mustard oil. In Ban Durga

VDVKC cluster the MFPs which will be value added are tamarind, sal seeds and char seeds to be made into deseeded tamarind, tamarind cake, sal shampoo and packed char seeds.

Other value-added products that will be processed in the VDVK clusters in the districts of Koraput, Rayagada and Sundargarh include tamarind cake, mahua oil, organic packaged rice, neem oil, neem cake, deseeded chironji and turmeric powder.

Among many initiatives, TRIFED, Ministry of Tribal Affairs is implementing to generate employment and income generation among the tribal population is the Van Dhan tribal start-ups programme, a component of the the 'Mechanism for Marketing of Minor Forest Produce (MFP) through Minimum Support Price (MSP) & Development of Value Chain for MFP' Scheme.

The Van Dhan tribal start-ups, also a component of the same scheme, is a programme for value addition, branding & marketing of Minor Forest Produces by establishing Van Dhan Kendras to facilitate creation of sustainable livelihoods for the forest-based tribes.

Over the past 18 months, the Van Dhan Vikas Yojana has gained tremendous ground with its quick adoption and robust implementation aided by the state nodal and implementation agencies across India.

With the VDVKCs gaining ground and starting production in Odisha with these clusters, the benefits of this programme will reach the tribals of this Eastern State and help in improving their lives and livelihoods.

YOJANA, a development monthly published since 1957, is a theme-based journal providing in-depth analyses and views on socio-economic issues in the broader framework of government policies. Although published by the Ministry of Information and Broadcasting, YOJANA is not restricted to expressing the official point of view.

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Let noble thoughts come to us from all sides
Rig Veda

IN THIS ISSUE

REGULARS

JULY ISSUE - NORTH EAST

Indian Literature

I am a regular reader of Yojana. I am very thankful to team Yojana. Yojana is a very good magazine for UPSC CSE preparation and also help me a lot in my preparation. Yojana is an important part of my preparation. The February edition "Indian Literature" helped a lot to learn about the past of our literature and The March edition "Union Budget 2021-22" was very well written. I want to suggest some more topics on Environment and ecology, farm bill, technology. I am thankful to all members of Yojana.

– **Gayatri**
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Diverse Topics

I am a regular follower of the Yojana magazine. I believe that it is the only material which gives concrete information about diverse topics. I find it useful for preparing for competitive exams. The budget issue was excellent that gave different views points of the experts. The entire budget was easy to comprehend by reading the magazine. I would like the team to also publish regarding 'Agriculture and its different practices: traditional and conventional methods with comparing it with global practices'. Also the topic like 'India as an emerging player for the new normal' can also be published.

– **Shivain Bhardwaj**
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Essential for Competitive Exams

I have recently come across this valuable magazine for past couple of months as a part of my UPSC-CSE preparation. Seriously this book is the most valuable book I have ever seen. It is very much essential for my mains preparation and very much useful for enriching the knowledge about the nation. Great thanks to YOJANA for rendering valuable services to the aspirants and also providing awareness to the people.

– **Rathna Mathivanan**
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Jal Jeevan Mission

I have been reading YOJANA Monthly magazine for couple of months. The April "special issue" was interesting and informative, focusing on the mission of ensuring pure water to all rural households, making it everyone's priority. I feel grateful that Yojana is bringing out such vital issues focusing on the welfare of society with governmental intervention. In fact, these issues inspire me to appreciate the initiatives taken to improve the condition of rural people.

– **Aamir Bhatt**
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Well Documented

Yojana's February-2021 issue on Indian Literature is one of the well-documented editions in recent times. Articles on various traditions & evolution of Indian Literature are equally praiseworthy for their holistic coverage of various aspects associated with the cover story. While the edition has given ample coverage to all popular literature of the country, it appears that the coverage of Telugu literature is seemingly inadequate. Since Telugu being a classical language it should have been represented more decently in a coveted publication like Yojana. The cover story article on the literary life of Gurudev Rabindranath Tagore is an additional attraction in the edition.

– **Satish Reddy Kanaganti**
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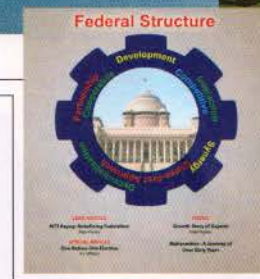
A must for Civil Aspirants

If anyone asks me how you prepare for current affairs, government policies, art and culture and many other things in vast ocean of general awareness, I reply them with "Just like Ocean it is also vast same with current affairs." Relevance and importance of topic matters for which I prefer Yojana for every aspirants preparing for any competitive exams but according to me it's a lamp in darkness of general awareness and must magazine for civil aspirants and defence exams like cds, afcat and other such like this. It will also helpful in interview mainly. I heartily congratulate and am thankful to all hard working members of team Yojana.

– Nikhil Yadav
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North East

I am thankful to Yojana team for providing valuable information on governance and democracy, government initiatives and issues of the country. I would like the team Yojana to come up with edition specially focusing on seven northeastern states each month. We people are so much unaware of many initiatives that are being sponsored by the government; definitely there are readers who will help to spread the government valuable initiatives, progress of the particular state and of course governance of the state in comparison to other states of the country.

– Karki Bikku
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Affordable & Easily Available

As an ardent reader of Yojana since July 2020, in this meager period of time I came to know that this magazine is easily available at an affordable rate

for students and learners and a complete knowledge booster for every reader. It is really important for those who are preparing for UPSC CSE, State PSC, etc. I would highly appreciate it if you publish a separate edition on the role of ECI especially after TN Seshan (former CEC).

– Krishnanandan Kumar
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Environmental Challenges

I have no word to express my immense gratitude towards the Yojana team, and the well-educated researchers who are a part of this magnificent team. This wonderful magazine focuses on all national and international issues which provide us ample support in getting awareness about the day-to-day happenings. I expect this Yojana team of yours will provide continuous national and international materials for all of us. I humbly request the galaxy of Yojana stalwarts to publish a special issue on the environmental challenges. I sincerely thank all learned authors of this wonderful and magnificent Yojana team.

– Dr. Ashok
Patna, Bihar

Economic Relations

Firstly, I would like to appreciate the efforts of team Yojana. I am a regular reader of this high-quality magazine since November. It gives me detailed information about specific topics with facts and figures so I can note it down for enriching quality answers. I would like to request the team to publish an edition that entirely emphasizes on India's bilateral relation with neighbors and major economic partners. Thank you.

– Devesh Anand
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Sarve Bhavantu Sukhinah

Death, suffering, pain, grief, and loss are the unfortunate realities around us in these unprecedented times. A tragedy of whose actual gravity is yet to be unfolded. While the second wave of the pandemic has tested and overburdened the existing healthcare systems, the chances of a third wave too cannot be negated with a time and scale yet to be known. The unpredictability of the virus and the scale of havoc it has done is unimaginable. It has disrupted every possible human activity. What began as a health crisis has soon turned into a devastating disrupter for trade and commerce wiping away millions of jobs due to varying degrees of lockdowns, which were announced in an attempt to control the spread of the virus. With the passage of time the trade-off between saving lives and saving livelihoods has grown starker. A milestone in the recent history of human civilisation, the pandemic is here to stay and we have no other option but to equip our healthcare systems to fight this massive battle, and vaccinate as much as we can.

The healthcare workers, frontline workers, doctors, researchers are facing enormous challenges one after the other. Long working hours in difficult and almost life-threatening conditions has taken a toll. Uncertainty and loss of lives around has affected the mental health of the society to a great extent.

The pandemic has interestingly reconnected as well as alienated the world in a strange manner. People are stuck wherever they are, and nations are trying to help each other in form of vaccines, equipment, and aid. The enemy, this time, is common for the entire humanity. Given the way, it is unpredictable, unforgiving, and mutating, there is no other way to come out of this enormous situation unless equity, equality, and collective will is demonstrated by the governments and nations across the world.

We are in this together, whether we sink or sail through, and of course all of us wish that there is a light at the end of this tunnel. Have we wondered how differently we will do and perceive things once all this is over? Will this strengthen our systems, resources, and resolve for a better living environment for all? Will we become more resilient and connected with each other, and with the nature? Will this make us more forthcoming in emphasising more on scientific temper, rationale, and well-being? Will this help us creating a society that is just, equitable, and for the welfare of all? We have a lot to answer to our younger ones who have not seen their peers for almost a year now and are stuck at their homes waiting for this to get over. Will we be able to ensure better living conditions, health, and a sustainable future to them? The challenge is enormous, and our resources will be depleted and stretched by the time things stabilise. Health is considered a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity. It is for us now to identify and establish the crucial linkages with our environment and rebuild a better world, with a healing touch and empathy for all. This suffering has to end someday, hope it leaves us as healthier and responsible humans. Hope this makes us kinder, more compassionate, and sensitive for the fellow humans as well as the environment. ❑

Connections for Survival

Sunita Narain

Health is an indicator of the environment. It is crucial to make the linkages between our health and the health of the environment to avoid lifestyle transitions.

In June 2017, the British medical journal "*The Lancet*" published a review of the prevalence of diabetes in 15 states of India. This study by a group of medical practitioners, funded by the Indian Council of Medical Research (ICMR), had worrying numbers. It found that while some 7 per cent people in India (based on 15 states' data) had diabetes, the prevalence of pre-diabetes (early signs, particularly elevated blood sugar levels) was a staggering 10-15 per cent, depending on the criterion used. This is no small health burden on a developing country.

Their conclusion is we are undergoing an epidemiological transition. States/UTs with higher GDP—Gujarat, Maharashtra, Tamil Nadu and Chandigarh—have a higher prevalence of this disease than Bihar or Jharkhand. Delhi and Goa, with high income levels, are still awaiting sampling. Rural areas have lower diabetes rates than urban. But most worryingly, the study finds that the poor in well-off urban states have higher incidence of diabetes than the rich in the same cities. In other words, the rich in rich cities have started to learn good food habits.

But the poor are now falling into the trap of bad food. The study also found that conversely, it was the more socio-economically advanced rural areas that were falling prey to diabetes. "It is an epidemic that is in a state of transition," it noted. With such large numbers of poor in urban areas and such large numbers of the getting-rich in rural areas, this can easily get out of hand. We are going from lack of food or malnutrition to over-nutrition because of bad food. This is a transition that we must avoid.

The fact is that India has what can only be described as a double burden of diseases. We have the diseases of the poor—everything from malnutrition to cholera. But we also have the diseases of the rich—cancer and diabetes.

Worse, as the ICMR study shows, the poor, who can ill-afford the diseases of the rich, are now afflicted by them.

But this is where the policy of prevention must kick in. We know that these diseases—called non-communicable diseases (NCDs) by the health community—are connected to our lifestyles. What do we eat? What air do we breathe? And what environment we live in? These are part of the package of "toxic" development. A model of development where we first pollute and then think of cleaning up. A model where we first industrialise-chemicalise our food, eat unhealthy junk and then think of going to the gym to exercise or eat organic. But the question is can we not avoid the transition?

Can we not go from being poor but unhealthy to being rich and healthy? Why should we inherit the diseases of a lifestyle that can be so easily avoided?

This is where change is essential. This is where we need to make crucial linkages—between our health and the health of the environment. Today, it is polluted water, which is visible in the death of our rivers. It is

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also one of the largest killers of babies in the country. Lack of clean energy in homes makes women cooking on biomass fuel suffer from killer respiratory disorders. It is also responsible for pollution that is making air toxic to breathe in our cities. So, health is an indicator of the environment.

For this reason the UN's Sustainable Development Goals (SDGs)—13 global goals that the world needs to achieve by 2030—must put children at the very centre. Every goal has a link to the child and every goal has a link to the health of the child and so the health of the planet. This is the human face of the SDGs that would define our progress or not.

But as yet, we rarely make this connection.

After many years of conferencing, WHO has identified four major risk factors for NCDs—alcohol, tobacco, poor diet intake and lack of physical activity. We now need strong action against foods that are high in salt, sugar, fat and low in nutrition.

We also know that economies are built on the use of toxins. So, it works conversely. The richer you get, the higher the health burden and higher the costs of healthcare. Remember also that it is always easier and far less expensive to deal with the diseases of the poor. Cholera, for instance, is about microbes in water that are easier to clean. Cancer, on the other hand, is about exposure to tiny chemicals in the same water. These are more expensive to clean.

Similarly, it is time we link climate change—the greatest lifestyle related catastrophe and health—with NCDs. We in our cities are certainly beginning to see how vector-borne diseases are growing because of the changes in weather. We know that heat and cold stress will grow making the poor more vulnerable.

> India has what can only be described as a double burden of diseases. We have the diseases of the poor—everything from malnutrition to cholera. But we also have the diseases of the rich—cancer and diabetes. Worse, as the ICMR study shows, the poor, who can ill-afford the diseases of the rich, are now afflicted by them.

But it is not just for WHO to make this call. The fact is that of our institutions must confront this reality. The link between foul environment—our air, water pollution, mounds of garbage or toxins in food— and health is so evident that it is crying for solutions. There is no hiding from this anymore.

The good news is that our health is also the only real trigger for environmental action. We will act to improve the environment when we know it impacts us directly. For instance, today, in Delhi, there is outrage against the pollution in the air. This is because when there is public health emergency in winter—when pollution levels spiralled out of control—people have come to understand the link between toxins and our bodies. So, people want change because now there is a link between environment and their health. This is important and different. From pesticide poisoning to water pollution, this body connection has been harder to establish. Also unlike in water pollution, we don't connect the dying river to our taps. And if we do, there is always the option of installing a household water filter, or just buying bottled water.

But air pollution is a great societal leveller. Despite installing air purifiers in their homes, the rich in Delhi and other cities still cannot escape foul air. Also, the nature of pollutants is mutating so fast that the air purifiers in our homes cannot keep pace with deadly poisons. So, it is our business to push for change. Ultimately, if the solution to air pollution is to get off the diesel car and get on the affordable but convenient bus or metro, we will do it. Because it is in our interest. We will change behaviour, not because it is in the planet's best interest. But in ours. The advantage is that if it is good for us, it is good for the planet. The ultimate win-win. ❑

Are We on a Cliff?

Balmiki Prasad Singh

For thousands of years, humanity lived in a harmonious relationship with nature. But today, both nature and world peace are under threat which has put humanity at a cliff. We have to move towards building an ecological civilisation and descending from the present cliff of uncertainty towards peaceful living and inclusive development and respect for nature.

The world is facing gloomy times in midst of the pandemic, conflicts, and natural calamities. Recently, we witnessed the horrors caused by nature in Chamoli district, the ground of the famed Chipko movement in Uttarakhand. Nature's warning is evident with visible cracks in its erstwhile harmonious relationship with humanity.

The wave of industrial revolution marked a major turning point in earth's ecology and humans' relationship with the environment. The agricultural revolution which grew five thousand years ago provided food and stability to society. The first industrial revolution that took place 250 years ago was primarily with coal and steam; the second with electricity and oil; the third with computers and its accessories; and now the fourth is a fusion of technologies in the physical, digital and technological worlds. During the 20th century, with the detonation of the atomic bomb, humanity entered a new era. We gained the power to destroy ourselves, without the wisdom to ensure that we must avoid doing so.

The author is former Governor of Sikkim, former Culture Secretary & Home Secretary, Government of India, and Executive Director & Ambassador at the World Bank, Washington, D.C. Email: bpsias@gmail.com
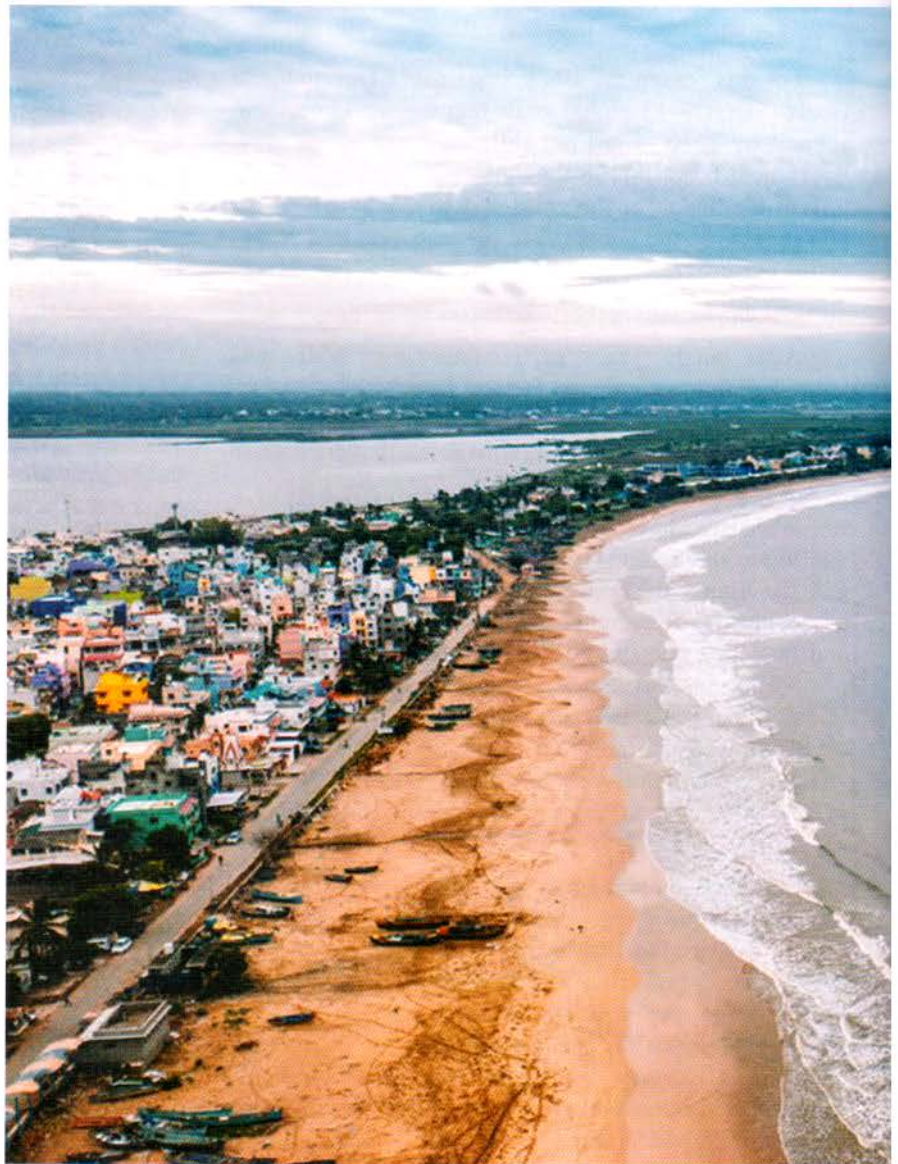
It is difficult to visualise a world in which states will not compete for power and domination. To my mind, the future of peace and harmony in the 21st century is likely to be directly linked to issues concerning five key realities of life today: (1) ecology, global warming, and climate change; (2) nuclear weapons, the emerging technology of warfare and the continuing arms race among nation-states; (3) geopolitics and nationalism; (4) religious extremism; and (5) poverty and inequality.

Widespread industrialisation, the proliferation of factories, destruction of forests for the construction of roads, blocking of rivers for building massive dams, and power stations, and the movement of vehicles and migration of people have all caused serious disturbances in the eco-system. The resulting climate change and global warming can no longer be wished away. In the context of climate change and global warming, experts predict that it is likely to cause many catastrophes including the displacement of billions of people around the globe.

Today, both nature and world peace are under threat. All these developments coupled with geopolitics have put humanity on a cliff and we do not know how to retrieve the present dangerous situation away from its self-destructive ways. This needs to be appreciated in a threefold perspective: (i) Nature; (ii) Science; and (iii) Wisdom.

Nature

Today there is a credible threat to human survival from global warming and climate change with the potential to damage the lives and habitats of billions of people in different parts of the world. The enormity of the challenge of conservation of ecology and halting climate change is formidable and calls for making changes in our behaviour and thinking. At the heart of the matter is: How do we move towards building fresh sensitivities for conservation in our civilisational processes?
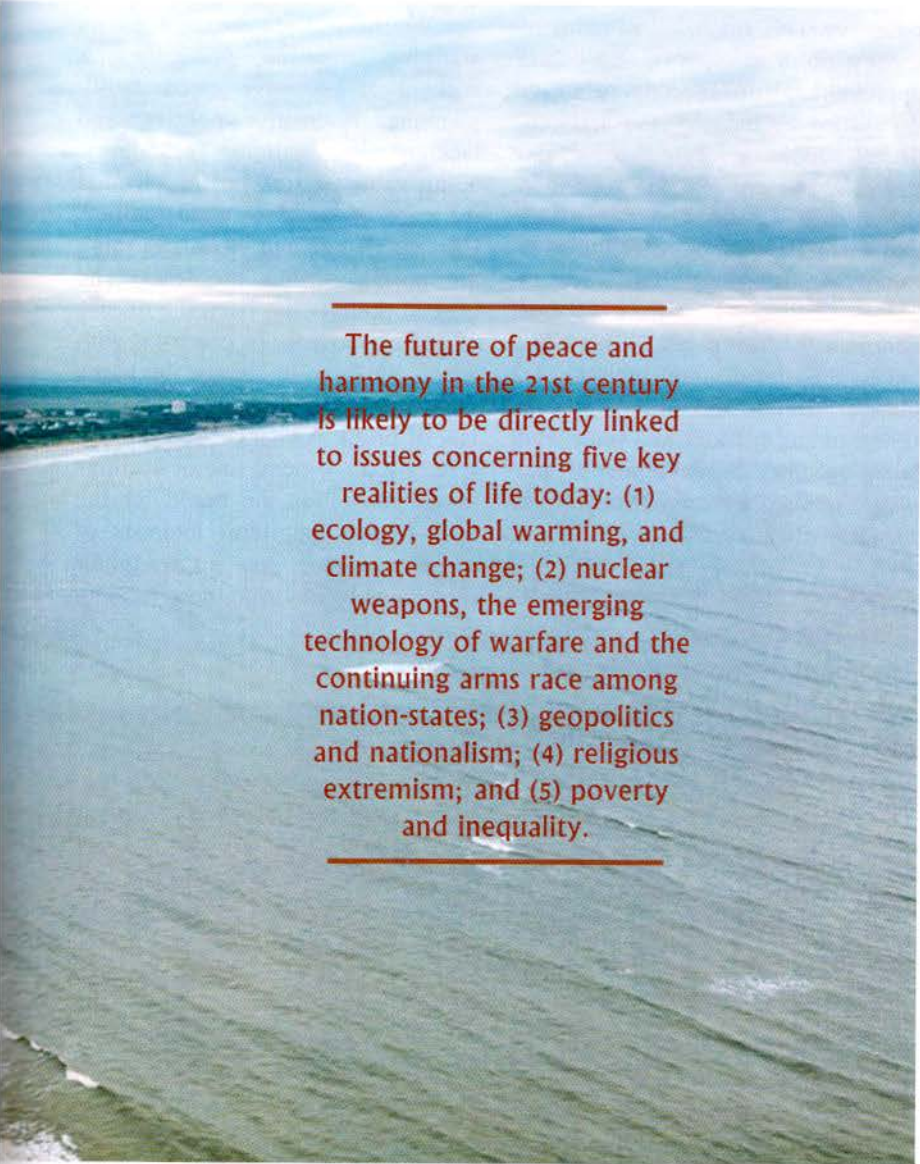
Five events of the recent times need to be particularly referred to: (i) Bushfires in Brazil and Australia of 2019; (ii) Extinction of species; (iii) Outbreak of pandemic SARS (Severe Acute Respiratory Syndrome) in Hong Kong in 2002-03; (iv) Coronavirus pandemic; and (v) Forest fires in California alongside the Covid-19 pandemic in 2020.

The magnitude of destruction caused by the Australian bushfire was hard to comprehend. More than 6.3 million hectares of land were affected by the fires. In 2019, the Amazon rainforest saw a surge in fires occurring in the rainforest.

It may be mentioned that a large number of species have already become extinct. To recount, the species we lost just in 2019; three bird species, two frogs, a shark, a famous snail and one of the world's largest freshwater fish were among those declared extinct in 2019.

The outbreak of SARS in Hong Kong in 2002-03 that had killed nearly 800 persons globally was declared pandemic.

We are facing the coronavirus pandemic that has engulfed the entire

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world and has adversely affected travel and trade, resulted in the global slowdown and, in fact, recession in the economy. All these have led to the deprivation of the lower and middle class as well as daily wage earners of their means of livelihood.

The 2020 California wildfires burned roughly 100 million acres of land. This triggered mass evacuations and caused deaths. Former US President Trump faced severe criticism for ignoring its linkage with climate change issues and failed to realise that it was not simply the issue of forest management but climate change. Earlier, the US had withdrawn itself from the Climate Change Accord popularly known as Paris Agreement. Thankfully, President Biden has reversed the decision and has also promised to spend $2 trillion over four years to escalate the use of clean energy and ultimately phase out the burning of oil, gas, and coal. These five events have given us signals that if ecology problems are not attended to urgently the world may not need world wars to destroy itself.

Science

In the last decades of the 20th century, the focus of society has shifted decisively towards science and its domineering daughter, technology, both in the western and developing countries. This emphasis, in terms of money, political support, and public approval, has led to an economy largely dominated by industry and services. Today, technology is pervasive and powerful and will continue to be so in the coming decades. The information and communications revolution is rapidly transforming our ways of communication which have become enormously fast-paced. This has led to the globalisation of products, cultural values, and information. It is integrating markets and trade. But what becomes of environment and nature in such a scenario, remains a matter of great concern.

> The information and communications revolution is rapidly transforming our ways of communication which have become enormously fast-paced. This has led to the globalisation of products, cultural values, and information. It is integrating markets and trade. But what becomes of environment and nature in such a scenario, remains a matter of great concern.

We have been brought to an alarming situation primarily on account of excessive greed, faulty planning, insensitive politics, and lack of imagination. Technology, being value-neutral, has accelerated the pace of the downward journey. Climate change and global warming are posing serious problems. The biggest polluter has been the release of carbon dioxide. To control it with speed, we have to change the terms of the market. It is based on the law of profit. A change would mean rejecting the general line of dealings in the market in the world for the sake of the long-term interests of the human race. Are we ready for this major break? And, here wisdom comes.

Wisdom

The Cambridge Advanced Learner's Dictionary defines wisdom as, 'the ability to use one's knowledge and experience to make good decisions and judgments.' Wisdom is a product of experiences and reflections not only of the present generation but of the civilisational processes of a nation and also of the world. Wisdom enables people to face challenges in the context of balancing conflicting claims of development and making the proper use of scientific inventions while keeping the requirements of

the Earth in view. Human beings can destroy their environment as well as can rise above petty interests, use technology and reverse the process of destruction of plant species and minimise carbon emissions.

At the present juncture, if we do not make use of our cumulative wisdom, nature will be harmed and succeeding generations will blame us for our failure. We have to keep the Vedic precept of 'माता भूमिः पुत्रो अहं पृथिव्याः' ('This earth is our mother and we are its sons.') in our minds.

Thankfully, on 12 December 2015, the Global Climate Accord was reached among 195 countries of the world in Paris. The Paris Accord, as it came to be known, commits countries to actions and policies that would restrict the rise in global temperatures 'well below' 2 degrees Celsius (3.6 degrees Fahrenheit) by the year 2100. They would even 'endeavor to limit' global warming to an even lesser, to 1.5 degrees Celsius. The Accord goes on to acknowledge that the Industrial Revolution and consequential burning of coal and petroleum are prime causes of today's greenhouse gas issues and that the countries in Europe and North America that became rich in the process have an obligation to support developing countries to come up to reasonable levels of economic development without similar burning of fossil fuels. On 19 February 2021, the US officially rejoined the Paris Agreement.

The Path Forward

The post-Covid world would be a different world. It has made evident that we are all interdependent and have to work for sharing economic benefits as well as fruits of science together, irrespective of religious, ethnic, economic, and cultural divides. We have to generate hope, courage, and respect for nature. We should employ science and human ingenuity with determination to overcome the present state of despondency. If science, spirituality, and wisdom go hand in hand, one can create a better world on this earth. Mahatma Gandhi said: 'Earth provides enough to satisfy every man's need but not for every man's greed'. It should become the maxim of the post-Covid world, that it will need farsighted leadership and efficient institutions of governance.

There is an imperative requirement to contemplate and work towards building an ecological civilisation that would outline the ways of living in harmony with nature.

The Covid-19 pandemic has not only highlighted the lack of basic healthcare for people but also the damage to the ecology. Let us develop collective wisdom that provides, in particular, to young people to think not just about themselves but about each other. Let us create an environment where values like honesty, hard work, responsibility, and fairness dominate our actions. Let us move towards creating a world where everyone has an opportunity for education and is conscious of saving the environment and defeating future pandemics. All these are possible when we do it together.

I believe in *Bahudha* Approach based on the maxim enjoined upon us by the Rigveda. It proclaims: *Ekam Sad Vipra Bahudha Vadanti*

The Real is One, the learned speak of it variously.

This provides for dialogue among different religions, cultures, and ways of living. It celebrates diversity and respect for harmonious living and nature. I have found that religions and spiritual values have the potential to play a big role in building trust and social cohesion. We have to move towards building an ecological civilisation and descending from the present cliff of uncertainty towards peaceful living and inclusive development and respect for nature. ❑

Policy and Practice

Dr Subhash Sharma

Developing countries including India should accord topmost priority to 'Health for All' in letter and spirit because it ensures not only human resource development, but also the well-being of our future generations. They have to increase their budget on health as proportion of gross domestic product, and as share of public expenditure to total expenditure per capita on health.

To put the conception of Health for All (HFA) in a historical perspective, the UN envisaged a comprehensive and integrated primary health care for all in Alma Ata Declaration in 1978 to promote equity and was driven by the community needs. The constitution of World Health Organization (WHO) mentions that health, well-being, standard of living, medical care, right to security in case of sickness as well as special care and assistance for mothers and children are quite significant and notable in the context of HFA. In addition, Article 3 of UDHR (Universal Declaration of Human Rights 1948), clearly provides that everyone has 'the right to life, liberty and security of person'. Obviously, right to life includes right to food and health (as interpreted by Supreme Court of India). The Alma Ata Declaration in 1978 was thus, in consonance with UDHR and WHO's constitution. In fact, at Alma Ata (now Almati in Kazakhstan) International Conference on 'primary health care' expressed the need for 'urgent action by all governments, all health and development workers, and the world community to protect and promote the health for all the people of the world'.

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Liberalisation and Privatisation: Impact on Health

WHO reiterated for Health for All, especially in 2005 and in 2011 too, though it used 'universal system' including a method for prepayment of financial contributions for health care, with a view to share risk among the people, under the influence of World Bank in particular and the processes of liberalisation, privatisation and globalisation in general. UN resolution in December 2012 further emphasised on it for overall human development and to be included in post-2015 development agenda. However, World Bank in its World Development Report (1993) had ranked common health care interventions according to cost-effectiveness; its minimum health package for low income countries considered to avert 1/3rd of estimated disease burden and 1/5th of that in middle income countries. But, unfortunately, many common ailments (moderately severe injuries and chronic conditions like diabetes, cataract, hypertension, mental illness and cervical cancer) were excluded from public funding in low income countries. Consequently due to 'structural adjustment' or economic reforms during 1980s in the poorest 37 nations, public spending on health per head declined by half due to cuts- e.g. in Mexico, it declined up to 60 per cent. Following consequences are notable:

1. Since State retreated from development interventions, there was a massive decline in public investment in health sector like other social sub-sectors (education, welfare of the deprived sections, etc.);

2. There accrued a huge shortage of doctors and supporting medical staff, leading to patients bound to go to private clinics;

3. There was a shortage of medical equipment, drugs and pathological facilities in public health institutions-hospitals were reduced to mere writing of prescriptions and patients were compelled to buy medicines from the open market and to get pathological tests done at private labs at higher costs;

4. Private doctors not only indulged in charging exorbitant fees but also prescribed unnecessarily more and costlier medicines as well as avoidable pathological tests;

5. Due to the laxity of the State regulatory apparatuses, even government doctors and supporting staff started giving more time at their private clinics;

6. Due to the retreat of state in providing subsidised food, sanitation facilities, there was a rise in communicable and non-communicable diseases, leading to long duration of morbidity, and finally death;

7. The phenomenon of free market ('invisible hand') was based on the 'individual care', considered as a 'private' good but in most of developing countries, there was no improvement in quality of health care,

Table 1: Health Expenditure as % of GDP (2018)

S.N.	Countries	Health expenditure as % of GDP
1.	U.S.	16.9%
2.	Switzerland	12.2%
3.	Germany	11.2%
4.	France	11.2%
5.	Cuba	11.19%
6.	Sweden	11.0%
7.	Japan	10.9%
8.	Canada	10.7%
9.	Denmark	10.5%
10.	Belgium	10.4%
11.	Austria	10.3%
12.	Norway	10.2%
13.	Netherlands	9.9%
14.	U.K.	9.8%
15.	Australia	9.3%
16.	Brazil	9.2%
17.	Chile	8.9%
18.	South Africa	8.1%
19.	Israel	7.5%
20.	Hungary	6.6%
21.	Mexico	5.5%
22.	Russian Fed	5.3%
23.	China	5.0%
24.	India	1.26%
25.	Bangladesh	3.0%
26.	Pakistan	3.0%

equity and efficiency for the local people while the private insurance companies, consultancy firms, private pharmaceutical companies and private hospitals earned profits.

Nowadays, public-private partnership (PPP), modernisation, value for money health insurance etc are the buzzwords in most of developed and developing countries. However, there are some alternative health systems in Cuba, China, Costa Rica, Malaysia, Sri Lanka, Rwanda, Venezuela and Thailand. Since 2002, there is Universal Health Care (UHC) coverage in Thailand for all people without any charge and now 77 per cent of all hospital beds there are in public sector. Cuba has a sustained drive to ensure cataract operation of all old people at public

facilities. There is equitable health service delivery with regulations like three years of compulsory rural service for doctors and nurses, and a radical shift in funding away from urban hospitals to primary health care across Thailand and Cuba. Health expenditure in Thailand increased from 1.7 per cent of GDP in 2001 to 2.7 per cent in 2008 higher than that in India. There are 9.4 doctors in Malaysia, 11.5 doctors in the Phillipines, 12.2 doctors in Vietnam and 18.3 doctors in Singapore for every 10,000 population, better than India (only 7 doctors for 10,000 population). We may have a glance at health expenditure as percentage of GDP at the global level in Table 1.

This reflects India's lowest public expenditure to health subsector. Even National Health Policy 2017 speaks of just targeting 2.5% of GDP to be spent on health. Consequently, Indian people usually do not have access to quality health services. India committed earlier for universal health care (UHC) coverage by 2030 by raising public funding from 1.26% of IGDP to 2.5% by 2025-about 70% of this is to be meant for primary healthcare. Similarly, India's per capita public expenditure on health in nominal terms is just Rs. 1,657 (2018-19)-much lower than that in Sri Lanka (Rs. 5,000) and Indonesia (Rs. 3,500). Third, against WHO norm of doctor to population ratio of 1:1000, India has very lower ratio of 1:1,404 (2021 February); in rural India the situation is worse 1:11,000 (2019). In addition, as per the WHO norm (2016) of 44.5 health workers per 10,000 population to achieve SDGs, and UHC, India has its half only-and health system has far less health workers, especially doctors. Most PHCs/Health Centers are almost defunct in many north Indian states, only the ASHA workers, pharmacists, nurses, etc sometimes visit there; further there are no facilities like beds, medicines, pathological tests etc there.

According to World Health Organization (2015), under-nutrition or malnutrition is the major cause of death in 45 per cent of all deaths among children below 5 years during 1990-

2015, the proportion of underweight children in developing countries declined from 28 per cent to 16 per cent in 2015. The MDG target for this indicator was met in North and South Americas, European region and Western Pacific region but not in Eastern Mediterranean region, South-East Asian region and African region. In India, about 47 per cent children are underweight. Similarly during 1990-2013, the number of stunted children declined globally from 257 million to 161 million, a decrease of 37 per cent. We could not however achieve this target. In 2018 as per FAO report, about 82.2 crore people suffered from chronic mal-nutrition, and 200 crore people had food insecurity in the world. Severe acute malnutrition increases with chronic poverty, lack of education of mothers, inadequate and low nutrient diet, and lack of clean water and sanitation. Hence India ranked 102 among 117 countries in Global Hunger Index 2019 and then India scored 30.3 and was in 'serious hunger category'-only 4 countries were in 'alarming hunger' category (35-49.9) then and only one country Central African Republic was in 'extremely alarming' category (score of 50 or more). In Global Hunger Index 2020 India ranked 94 out of 107 countries, with a score of 27.2 (in 'serious hunger' category- score range of 30-34.9) as per this report 14% of Indian population is under nourished. Second 17.3% of children under 5 are wasted in India. Third 34.7% of Indian children are stunted. However, during 2000-2020 GHI score has declined from 38.9 to 27.2 for India-a decrease of 11.7 percentage points.

SDGs: Unfortunately, by 2015, most of the developing countries including India, could not achieve rest of the MDGs. Hence United Nations declared 17 Sustainable Development Goals (SDGs) with 169 targets-it is also called 'Transforming Our World: 2030 Agenda for Sustainable Development, Sustainable development has been defined by Brundtland Commission in its report entitled 'Our Common Future' (1987): 'to meet the needs of the present generation, without compromising the

> About 80% of diseases of water-borne, hence safe drinking water should get top priority. For sustainable water management the current economic system needs a 'paradigm shift', and water sources should not be privatised, as these are community resources for local people and their future generations-water for healthy life.

ability of future generations to meet their own needs.'

Six years have passed since the beginning of SDGs in 2015, but most of the countries are not on the track and by 2030 only a few countries would be able to achieve SDG targets.

Environment for Health: The policy identified 7 priority areas for improving the environment for health: (a) Swachh Bharat Abhiyan; (b) Balanced healthy diets and regular exercises; (c) Addressing tobacco, alcohol and substance abuse; (d) Yatri Suraksha-preventing deaths due to rail and road accidents; (e) Nirbhaya Nari-action against gender violence; (f) Reduced stress and improved safety at work place, and (g) reducing indoor and outdoor air pollution.

Shifts in Public Health care Delivery: There are 7 shifts in organising public healthcare services:

1. Primary care-open selective care to assured comprehensive care with linkages to referral hospitals;

2. Secondary and tertiary care-from an input oriented to an output-based strategic purchasing;

3. Public hospitals- from user fees and cost recovery to assured free drugs, diagnostic and emergency services to all;

4. Infrastructure and human resource development-from normative approach to targeted approach to reach under-serviced areas;

5. Urban health- from token interventions to on-scale assured interventions, to organise primary health care delivery and referral support for urban poor.

6. National Health Programmes- integration with health systems for programme effectiveness and contributing

UNIVERSAL HEALTHCARE

Over 50,000 Ayushman Bharat Health and Wellness Centres
Operationalised

6.43 crore people screened for hypertension, **5.23 crore** for diabetes & **6.14 crore** for cancers

With operationalisation 50,025 Ayushman Bharat - Health & Wellness Centres, 1/3 of the target has been met

This has led to improved access to **affordable primary healthcare for over 25 crore people**

HWCs have helped in interventions such as risk communication, contact tracing, community surveillance and early identification of cases

to strengthening of health systems for efficiency; and

7. AYUSH services-from stand alone to three dimensional mainstreaming.

There is a gender disparity and male bias in health care globally, nationally, and locally in following ways:

1. In 2016, 23.8 lakh patients visited AIIMS, New Delhi for treatment but of them only 37% were women, though it is confirmed that women report more illnesses than men but they are treated less.

2. Male bias is further exacerbated by poverty, location and other social factors.

3. In the developed countries, too, women suffer from heart diseases as much as men but get recognised and treated far less than men.

4. Though women's bodies respond differently to drugs due to smaller organs higher fat & hormones but the medical tests / researches on male bodies are taken as reference point.

Therefore, there is an urgent need to address such a bias and gender disparity at the earliest to ensuring health for all.

'Health for All' also requires safe and clean environment, avoiding of chemical fertilisers and pesticides as well as good hygiene (total sanitation) for all. On 2 October 2019, India's more than 700 districts and about six lakh villages were declared 'open defecation free' (ODF)- this is a grand achievement indeed but there is a need to sustain it. The trained six lakh volunteers (in interpersonal-communication) are further required for solid and liquid waste management. U.P. govt named toilets *'Izzat ghar'* and it had positive impact. Further water should be conserved as a common good, as it is a social, economic, and human right. About 80% of diseases are water-borne, hence safe drinking water should get top priority. For sustainable water management the current economic system needs a 'paradigm shift', and water sources should not be privatised, as these are community resources for local people and their future generations-*water for healthy life*.

Further for mental health, there is neither adequate consciousness among people nor adequate medical facilities in all parts of India. As per National Mental Health Survey (2016) life time prevalence of mental illness in India is 13.7% with over 15 crore patients needing active intervention; only 49% have a mental health facility within 25 km radius and 26% people have no mental health facility within 50 km radius; 59% people have no de-addiction service; 80% people have no health insurance; and 28% of global suicides occur in India. In Bihar, there has been a rise of 30% in mental disorder cases during 2012-2019. In 2019 Koelwar (Bhojpur district) mental hospital registered more than 50,000 mental cases. Despite recovery of many mental patients their families are not taking them back. ❑
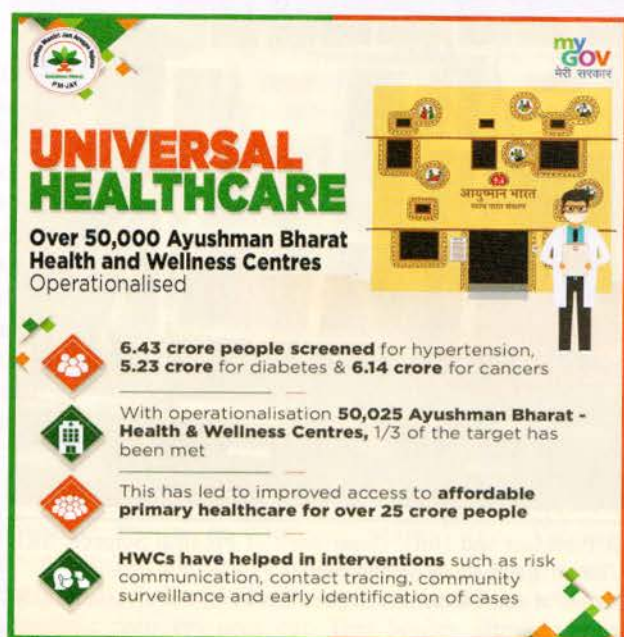
The Pandemic & Global Synergy

Dr Gouri Sankar Nag
Ayush Mazumdar

> India's vaccine diplomacy provides the scope to reflect its cultural values imbued with democratic ethos, cooperation, humanity, development and compassion coupled with the vision of India as a responsible global player deserving the United Nations Security Council (UNSC) permanent membership. India assumes a significant position in the global supply chain of the vaccine due to its time-tested production capabilities and being the world's largest producer of vaccines.

The Covid-19 pandemic is a seismic event that continues to grip the world. Despite being a biological domain-related concern in its purest nature and a pandemic characterised by global health emergency, the scope of the event was remarkably discernible in other aspects of human life ranging from socio-cultural, economic, and political level. The notion of correlation between various countries characterised by the temporal and spatial interconnectedness which played such an important role in the proliferation of the disease requires consideration to justify the idea of the concept of "Global Village" as being acute.

Nation-states as being the fundamental sovereign unit saw their role perception as well as their role domain significantly increased which, in turn, provided higher leverage for the states with regard to political decision-making at various levels of action. Nowhere is it more palpable than in the realm of generation, availability and distribution of the various vaccines.

The reality of human well-being defined in terms of having a stable and healthy body cannot be subjected to infra dig by anyone whatsoever. Starting from the microscopic unit of the individual to the macroscopic

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Effective Allocation of Covid-19 supplies received from the Global Community

The global community has extended a helping hand in supporting efforts of Government of India in this collective fight against the global Covid-19 pandemic. Medical equipment, medicines, oxygen concentrators, ventilators etc., are being provided by many countries.

A streamlined and systematic mechanism for allocation of the support supplies received by India has been put into place, for effective distribution of the medical and other relief and support material.

The Indian Customs is sensitive to the need for availability of Covid-related imports including Oxygen & Oxygen related equipment etc., and are working 24X7 to fast track and clear the goods on arrival and lead to expeditious clearance within hours. The steps taken for expeditious clearance on fast track basis are as follows:

- The Goods are given high priority for clearance by the Customs Systems for processing over other goods.

- Nodal Officers also gets alert on email for monitoring and clearance.

- Monitoring by senior officers for pendency of Covid-related imports is also being undertaken.

- The handholding to the trade is given for complying with the requirements beforehand.

- Outreach activities and Helpdesk enables Trade to get the goods cleared on arrival.

  In addition to faster clearance,

- Indian customs has waived Basic Customs Duty and Health cess on goods identified for defending Covid.

- When imported free of cost and distributed freely, based on the state govt. certification, IGST is also waived.

- Further, for import of oxygen concentrators for personal use, IGST has been reduced from 28% to 12%.

The medical items started coming in as donations from different countries after the rise in sudden cases of Covid across the different parts of the country from the last week of April, via MEA. The materials are being given by countries due to the immediate and urgent requirements in different parts of the country. This help is over and above what Govt of India is already providing, and is thus an additionality for the states and UTs. Later on, supplies coming from private companies, entities etc also started routing through the Niti Aayog.

The Ministry of External Affairs is the nodal agency for channeling offers of help from foreign countries and coordinates with Missions abroad. The MEA has issued its own SOPs which are applicable across board.

Indian Red Cross Society

For all consignments received via MEA and coming as donations from foreign countries; the consignee is the Indian Red Cross Society. Upon receipt of the papers outlined in the process flow chart, IRCS issues the necessary certificates immediately to HLL for processing customs and regulatory clearances at Airports. IRCS also ensures liaison with MoHFW and HLL so that delays are reduced and quick turnarounds are achieved.

level of communities, the aspect of health is central to welfare. Such centrality when disrupted or threatened creates a humongous clamour for instant relief; in this case such action was observed in the pursuit for a vaccine to end this interlude. Since, nation-states are the basic sovereign fundamental units responsible for responding to such challenges, the response in the field of vaccine development have followed the nationalist lines albeit it also cuts across the national boundaries as witnessed in the various collaborative international efforts between various manufacturing companies and laboratories engaged in research.

But when it comes to allocation of vaccine consignment, the launch of India's vaccine outreach initiative known as "Vaccine Maitri" (i.e. Vaccine Friendship) demonstrates India's concern to bring down the curve of the pandemic as a powerful booster to economic recovery prospect. This benign altruism was

made possible by reasoned stand and espoused philosophy of "*Bahujan Sukhaya Bahujan Hitaya*". In this context, the recognition is earned as Indian vaccines reflected her pool of scientific skill and professionalism. Besides, India assumes a significant position in the global supply chain of the vaccine due to its time-tested production capabilities and being the world's largest producer of vaccines.

The significance of India's vaccine diplomacy can also be understood if we take into account the nature of action of the developed countries which shows their propensity to reserve doses much beyond the need of their population. The situation of the developing countries, on the contrary, is messy because majority of people in the developing and poor countries could remain unprotected if they cannot afford to pay for the vaccine. Put in this perspective, the nobility of India's move stands upon her commitment to share her mastery in inventing the

Sanjeevani with all fellow countries not only those situated in South Asia but also to different countries of the Middle East to Africa and beyond. It is undoubtedly a great achievement so far as the domain of our foreign policy and soft power are concerned. Needless to say that it would definitely leverage our prestige and facilitate our mobility to higher position of power.

The conceptual understanding of power can be gauged from the various definitions that have been put forward by various stalwarts. Bertrand Russell in his work, "*Power: A New Social Analysis*; 1938", defines power as the production of intended effects. Robert Dahl in his work, "*Modern Political Analysis*; 1991", described power as a kind of influence; it is exercised 'when compliance is attained by creating the prospect of severe sanctions for non-compliance'. This usage of the word "sanctions" in the latter definition signifies the limited or narrow imagination of what power yields. As stated by Joseph Nye, "*Sometimes we can get the outcomes we want without tangible threats or payoffs*". This is what is called "second face of power" and a country may obtain the outcomes it wants in world politics because other countries—admiring its values, emulating its example, aspiring to its level of prosperity and openness—want to follow it. Vaccine diplomacy as the nomenclature to define this phenomenon, bends towards the soft power perspective. Soft power rests on the ability to shape the preferences of others. The sources of soft power of a country according to Joseph Nye rest primarily on three resources: its culture (in places where it is attractive to others), its political values (when it lives up to them at home and abroad), and its foreign policies (when they are seen as legitimate and having moral authority) (Jospeh S. Nye, 2012).

> Since, nation-states are the basic sovereign fundamental units responsible for responding to such challenges, the response in the field of vaccine development have followed the nationalist lines albeit it also cuts across the national boundaries as witnessed in the various collaborative international efforts between various manufacturing companies and laboratories engaged in research.

India's vaccine diplomacy provides a great fusion of three sources as mentioned above. It provides India with the scope to reflect its cultural values imbued with democratic ethos, cooperation, humanity, development and compassion coupled with the vision of India as a responsible global player deserving the United Nations Security Council (UNSC) permanent membership. The idea of compassion and generosity are a distinct hallmark of Indian wisdom which is engraved both within the domestic public space as well as its institutions.

Of course, in today's world heavily loaded by hard power there is no gainsaying the fact that our dependence on soft power potentialities cannot be absolute. Nevertheless, to succeed in world politics; the path that India adopts with regard to her vaccine diplomacy provides her with unique advantage. For instance, India's well-positioned stature in terms of vaccine manufacturing has been recognised by Canadian Prime Minister, Justin Trudeau. Broadly viewed India's positive response would denote the deep humanitarian democratic ethos within Indian political wisdom.

India's Covid-19 vaccines are the cheapest in the world with two frontrunners; "Covishield" developed by the Serum Institute of India and the "Covaxin" developed by the collaboration of ICMR and NIV with Bharat Biotech (Mondal, 2021). A third vaccine, Russia's Sputnik V has been approved for emergency use in India by Drugs Controller General of India (DGCI). The local production of Sputnik V will begin in July 2021 and Hyderabad-based Dr Reddy's Laboratories will manufacture the vaccine in India.

India has supplied vaccines to nations including Bhutan, Maldives, Bangladesh, Nepal, Myanmar, Mauritius, Seychelles, Sri Lanka, the UAE, Brazil, Morocco, Bahrain,

Oman, Egypt, Algeria, Kuwait, and South Africa. Supplies made under grant amount to 56 lakh doses and commercial supplies amounting to over 100 lakh doses. Indian vaccines have reached Afghanistan and also it is reaching the shores of CARICOM countries in the Caribbean, Pacific Island States, Nicaragua etc. India's ubiquitous vaccine delivery programme to the rest of the world is situated within the framework of Vaccine Maitri which is quite synonymous with the SAGAR (Security and Growth for All in the Region) doctrine of India. The vaccine developed by the Oxford-Astra Zeneca has got the required WHO approval for usage in various countries and the Serum Institute of India has collaborated with the former as a global manufacturing partner (Mordani, 2021). This gives legitimacy to India's vaccine efforts further.

> Diplomacy is all about astute conduct of international relations with other countries based on certain parameters of connectedness and cooperation. It is worth noting that India's first supply of vaccine dosage went to Bhutan and Maldives, these two countries being India's closest ally in the South Asian region.

Diplomacy is all about astute conduct of international relations with other countries based on certain parameters of connectedness and cooperation. It is worth noting that India's first supply of vaccine dosage went to Bhutan and Maldives, these two countries being India's closest ally in the South Asian region. Bhutan happens to be the only nation within the SAARC to be not co-opted by the Chinese BRI tentacles. India should follow a preferential and prudential line of judgement when it comes to vaccine distribution. Being generous is a great virtue but generosity should be backed by judicious calculation. India has been subject to misfortune in the past in its own backyard during the post-Independence era. The analytical introspection reveals that most of the Indian neighbours treat India from dual perspectives of enjoying her assistance while viewing her as hegemonic. However, such idea needs re-interpretation because of changing dynamics in the post-Cold War order and also in view of constant adjustments in the wake of China's intrusion in the South Asian region.

The apparatus of traditional diplomacy is well recognised by the 1961 Vienna Convention on Diplomatic Relations but in the age of globalisation, there is a complexity in the global relations opening up new avenues for the conduct of global diplomacy involving newer actors including the non-state actors such as transnational corporations, civil society organisations, non-governmental organisations but they are not sovereign and their activities must pass through the window of approval created by the sovereign unit of the state representing the will of the people. Therefore, such complexity needs to be streamlined because there should not be any scope for political anxieties to develop as it did during the second-decade of the twenty first century. Rather, it provides a scope for democratic ethos celebration as the only way to counter a global challenge is through a concerted global response. The word 'concerted' in this context refers to the direction provided by the democratic nation-states as sovereign responsible units. The Kantian democratic peace thesis provides the light in this direction. ❑

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The Pandemic through Gandhian Perspective

Dr Suchita Krishnaprasad

Covid-19 has pushed the world into a pervasive crisis encompassing every aspect of human life. With the passage of time the trade-off between saving lives and saving livelihoods has grown starker. This onslaught of circumstances calls for an alternative way of managing human affairs and revisiting Gandhi. This article attempts to relate the present crisis to the Gandhian way of thinking to arrive at some concrete take-homes.

Covid-19 has pushed the world into a pervasive crisis encompassing every aspect of human life. It has altered our consumption pattern, shocked our smart production systems, changed the modes of education and entertainment and has made us take a serious relook at the 'social animal' definition of ourselves as a race that has increasingly learnt to dominate this planet. Arguably, the most fearsome feature of this pandemic is its uncertainty: from the symptoms and their absence, to the possibility of its return with a vengeance, and the serious after-effects on the 'recovered' cases in terms of possible long-term damages it can cause to the vital organs of the patients, requiring persistent medical testing and appropriate interventions long after the infection has subsided. It is time to introspect about the wrongs we have committed as 'civilised' inhabitants of earth which makes our ways of living so precarious, inequitable and unsustainable today. Beginning with containment of wants, Gandhian economics, grounded on the premises of non-violence, truth, and non-covetousness, is instantly antithetical to the mainstream economics.

Dignity of labour, self-sufficient and strong village economy and the principle of trusteeship emerge as logical corollaries of this system of thought with an inbuilt thread of morality running through it to offer an integrated view of managing economy polity and society harmoniously. Gandhian thought can provide some critical insights during this exercise in introspection.

When the lockdown was extended to ensure that people—Stay Home and Stay Safe— people living in these Dickensian condition decided to flee because firstly their savings had dried up, and their congested dwellings with common toilets were hardly 'Safe Homes'. And this was a saga of massive hardships for millions who only knew they had to leave where they had survived so far but did not know how to reach where they wanted to, and whether they would live to see that destination.

The textbook economics, aka positive economics, starts with the premise that wants in general are insatiable, and that the resources are limited. Gandhian system, steeped in normative thinking[1], starts with the idea of containment of wants, because after all there is enough on this earth for everybody's needs but not enough

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for one man's greed. Greed breeds violence and gives rise to the need to exploit others, which is against the first primal principle of Gandhian system: non-violence. Squeezing wages and exploiting workers is also equivalent to violence. Unequal land holding is manifestation of greed, which was sought to be corrected through Bhoodan movement by Gandhiji's illustrious disciple, Vinoba Bhave. Creating circumstances that force people to migrate because of poverty might amount to violence at a societal level. Gandhiji wanted to reverse this by making village communities stronger and self-sufficient. Empowering villages through a benevolent *Jajmani* system was his idea of nurturing the roots of India that lived mostly in villages. Well-being of rural India was of utmost importance to him and people who migrated after that had been achieved, would be exercising their choice.

Gandhiji's ideas about choice of technology have been much debated, but the key idea of optimally using the local resources and skill are the basic tenets of any text book trade theory. Machines are useful. But they should not impact the dignity of labour. Gandhiji's concept of dignity of labour has several dimensions[2]. Firstly, it means that no labour is menial. In fact, he strongly recommended a few hours of manual labour every day. That would ensure physical and mental fitness besides sensitising the employers of manual workers appropriately. Dignity of labour also means more importance to the man behind the machine. It means the need to treat that man with decency. Decency would include healthy and clean working conditions and reasonable wages. His intervention in the Ahmedabad textile workers' strike can be seen as an attempt to ensure decent work. He was not against industries. Industries would be necessary for progress, and they would have to make profit in order to

survive, but again the profits belong to the society, that provided every possible resource to an industrialist, who is therefore a mere trustee of this wealth. It becomes his obligation to look after the needs of the society. Using profit towards larger social good, which is the crux of Corporate Social Responsibility, can thus be traced back to Gandhiji's idea of Trusteeship.

Although his ideas never fail to appeal to higher consciousness,


Gandhian economics, grounded on the premises of non-violence, truth, and non-covetousness, is instantly antithetical to the mainstream economics. Dignity of labour, self-sufficient and strong village economy and the principle of trusteeship emerge as logical corollaries of this system of thought with an inbuilt thread of morality running through it to offer an integrated view of managing economy polity and society harmoniously. Gandhian thought can provide some critical insights during this exercise in introspection.

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it is customary to applaud them as legends that can only be admired from a distance[3]. It is also an easier way to escape the responsibility of implementing them or even experimenting with them.

However, the current pandemic has paved way to possibility of such experimentation, and there are several grounds to justify this position.

a) Changing Consumption Pattern

The pattern of consumption has changed significantly especially during the lockdown periods. Studies have noted a substantial reduction in 'discretionary' (read as conspicuous) consumption. Consumers are less blinded by the 'brand-value' and are increasingly alert about distinguishing between essential and non-essential consumption, even while choosing a brand.[4] This is a form of 'containment of wants', though forced by circumstances. Nudging households to choose healthy lifestyle to bolster immunity in the face of Covid-19 is another blessing in disguise. Preferences are shifting to natural and herbal remedies and learning about their goodness and lasting effects. Ceremonies have become spartan since huge gatherings are dangerous. More time at home is a 'Razor's Edge, kind of a situation. On the one hand there are studies of higher incidence of substance abuse, alcoholism anxiety and depression[5] and on the
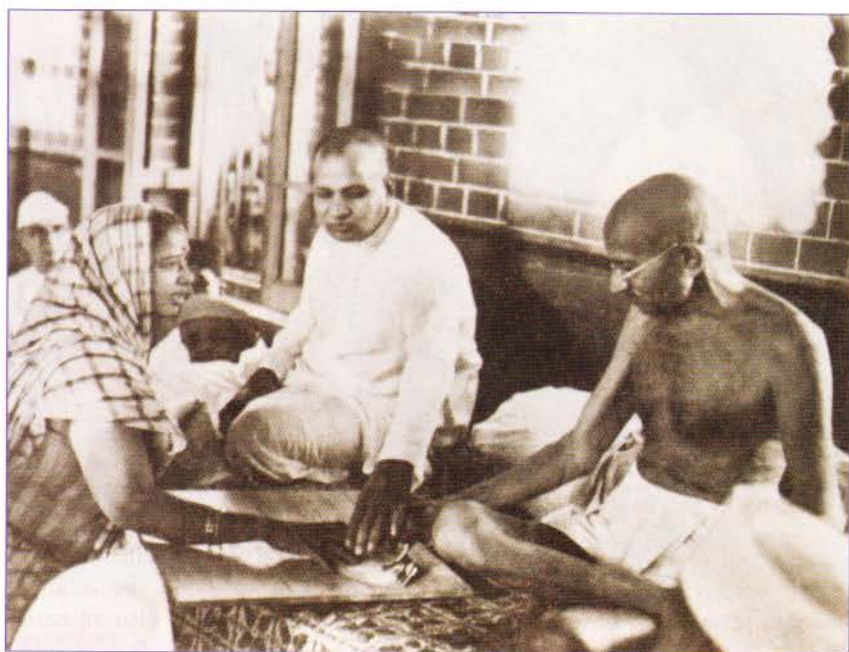
other innovative and creative ways are being devised to make home-stay more bearable. These include online learning programs from those aiming at honing untapped skills to the ones on self-healing, and discovering inner peace. It is true that the deaths and morbidity associated with the pandemic along with the financial stress and being largely homebound has led to more cases suffering from depression and anxiety, but it is also true that more and more people in our society are willing to acknowledge these cases as 'normal', and are willing to reach out to provide assistance at least through social media.

Indeed the Subjective Well-Being (SWB) can swing in either direction, as brought out by an exhaustive study based on a cross sectional survey of over 1000 participants in China[6], and how we tweak the support systems towards choosing a healthier lifestyle now can have a critical impact for the times to come.

b) Changing Patterns of Production

As the world grapples with the problem of fragmentation of the supply chain, the necessity to restart in whatever manner possible, producers may be forced to relocate

their sources of supply. An UNCTAD economist, P. Fortunato, in his study on "How Covid-19 is Changing Global Value Chains (September 2, 2020)", observes a trend towards relocation of the GVC (Global Value Chain) in favour of a greater use of local skills and materials. Compelled by the pressures of circumstance we might redevelop production systems of the kind that Gandhiji advocated strongly to promote self-sufficiency.

Further, experts highlight compulsions to turn to green technology[7]. The Confederation of British Industry, for instance, has urged the government to invest in green

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technology and jobs[8]. In a significant move to ensure sustainability in post-Covid scenario, the UK government has even announced Green Recovery Challenge Fund[9]. Interestingly, investment in green technology can unleash a significant multiplier effect with a high employment potential as noted by ILO.[10]

c) Empathy towards the Deprived

The migrants reaching their home States by foot, by legitimate or illegal means[11] has been a heart-wrenching story.[12] But it has also led to individuals and NGOs rising to the occasion to support these unfortunate fellow beings through supply of food packets and other materials to ease their agony. The State Union governments did arrange Shramik trains to ensure safe return, but the role of individuals[13], NGOs[14] and religious institutions[15] that extended a helping hand so spontaneously cannot be overemphasised. If the reverse migrant movement is akin to partition, so is the extent of support and help from various quarters of the society. Gandhiji would have not only appreciated this spirit of empathy but would have perhaps succeeded in processing into institution building to sustain it longer.

When the existing patterns of socio-economic systems are shaken, they create a space for a paradigm shift. It is also an opportune time to correct the previous malfunctions of the system. For example:

Reducing Rural-Urban Imbalance: Greater dependence of our population on agriculture indicates non availability of non-agricultural jobs. Providing more jobs in the non-agricultural sector, and more so in manufacturing is a need of the hour[16]. Promoting agro-based and related commercial activities such as fisheries and food processing can go a long way in providing more opportunities of gainful employment in the rural sector, which would be a step in Gandhian direction.

Domestic Violence and the Gender Issue: It is a well-recorded fact that there is an increase in violent, abusive, impulsive, compulsive, and controlling behavior and aggression directed towards women during the periods of economic hardships. Studies suggest an astonishing rise in the harassment of women behind closed doors. While everyone in the household may be living under a potential threat to life, financial stress, lack of opportunities to socialise, frequent violent outbursts among men desperate for alcohol or tobacco seem to be considered socially acceptable. Being trapped in a space with violent or manipulative individuals could lead to increased rates and intensity of threats, physical, sexual and psychological abuse, humiliation, intimidation, and controlling behavior, which is heightened by the lockdown. And this is true of developed countries as well[17]. In the first five weeks of lockdown, Pune police reported an increase in the cases of domestic violence by 12 times.[18]

> Any attempt to engage in greater sustainability is Gandhian in spirit, because it can be achieved only by rising above the baser instincts of greed, violence and petty self-importance. In a truly Gandhian perspective, the 17 Sustainable Development Goals can be seen as an integrated vision stemming from a peaceful and harmonious coexistence of human beings with each other, with nature, and other beings supported by nature, which Gandhiji might have longed for.

These numbers have justified the term 'parallel pandemic' to domestic violence, underlining the dark gender impact of the pandemic, but they have also brought out the issue of gender disparity and the disenfranchisement of women in a manner that can no longer be overlooked. That family, which ideally the basic nurturing cell in the society should exhibit its stark opposite during such hard times especially to the very agents that provide the nourishment, is a strong and shrill alarm the pandemic has played, which needs to be heard.

d) Treatment to the Reverse Migrants

States which have had a pressure for accommodating reverse migrants now have an opportunity to deploy their expertise at home. Many such States have reportedly undertaken skill-mapping, which had never been thought of before. These States can use this experienced labour force to work on improving infrastructure, building industrial estates, for setting up new MSMEs, etc. to attract more business. In fact, the initial employment generation can take place through such investment, which can push up the economic growth through multiplier.

As for migrants with experience of running tiny or home-based businesses, it is possible to bring them together into clusters to form co-operatives. This is simply because migrants who have returned back are more likely to tune and team up with each other, and such trust would prove a strong foundation for a new enterprise especially in the form of co-operatives.[19] There are successful examples of migrant workers' co-operatives that emerged as a response to crisis in many countries. States can benefit by collaborating with ILO which has a rich experience of hand-holding many such projects across the globe.[20] Finally, co-operatives are important because they facilitate decentralisation of the process of growth, which is Gandhian in spirit.

e) Urban Development

Covid-19 has emphasised the need for cleanliness and hygiene like never before. It has compelled the urban local bodies to improve and

States from where the migrant workers have moved out have had to raise wages due to severe shortage of labour. There are instances where workers have been given air tickets to return to work! These may be anecdotal instances, but they do echo the need to treat workers with dignity though under duress. One only hopes that at least some such benefits last long enough to emerge as new practices. This should take us to Gandhiji's intervention in Ahmedabad textile strike to negotiate in the issue of plague allowance. In my opinion there are several reasons that necessitate thinking of a Covid allowance and determining some standards to calculate it, and these are:

1. The virus is very likely to stay longer than was initially feared. That makes it systemic and not temporary, and hence the need to institutionalise the support through designing a Covid allowance.

2. The lockdown inspired by the pandemic has led to what is being called as the New Normal of working from home. This mode saves the variable costs of his establishment such as power charges, use of computers, maintaining canteen facility, and overall housekeeping etc. for the employer, while the employees bear a higher cost in real and money terms. This is because: i. Employees might now work for longer hours, being available 24x7, ii. They have to face the stress of managing the workspace and home-space together, and iii. They might have to make an additional investment to upgrade infrastructure. It is important to compensate the employees for this.

3. Employees who travel to their workplaces during these times run a high risk of contracting the infection themselves if they resort to public transport. Opting for 'safer and more personalised travel' to workplace, on the other hand is sure to hike their travel expenses.

4. It is now becoming clear, that those 'recovered' from Covid are indeed far from danger, as there are cases showing serious damages affecting vital organs of the patients even after recovery. The expenditure on testing and medicines is likely to rise unpredictably for those who contacted the infection even once.

5. Lastly of course the ability to pay of the employer would have to be taken into account, because harmony in employer-employee relationship is crucial to Gandhian view of industrial relations.

expand their health services. It is also a wake-up call to transform slums and the living conditions therein. Ignoring hygiene or treating it as welfare or a charitable act is not going to help because these are necessary for everyone's survival now. In a way, ensuring decent living conditions, which is implicit in dignity of labour is thrust upon us as a need for survival. One thing the pandemic has taught us is that an infection anywhere is a threat to health everywhere.

f) Decent Wages and the Covid Allowance

States from where the migrant workers have moved out have had to raise wages due to severe shortage of labour. There are instances where workers have been given air tickets to return to work.[21] These may be anecdotal instances, but they do echo the need to treat workers with dignity though under duress. One only hopes that at least some such benefits last long enough to emerge as new practices. This should take us to Gandhiji's intervention in Ahmedabad textile strike to negotiate in the issue of plague allowance.[22]

g) Environmental Concerns

Lockdown reportedly reduced the air and water pollution substantially.[23] It would be up to us to maintain it with as much caution as possible. For instance, there might be greater possibilities of shifting to more eco-friendly urban transport system and manufacturing systems to enable reduction in the carbon emissions along with creation of more employment opportunities.

Conclusion

Any attempt to engage in greater sustainability is Gandhian in spirit, because it can be achieved only by rising above the baser instincts of greed, violence and petty self-importance. In a truly Gandhian perspective,

the 17 Sustainable Development Goals can be seen as an integrated vision stemming from a peaceful and harmonious coexistence of human beings with each other, with nature, and other beings supported by nature, which Gandhiji might have longed for. The pandemic has opened up opportunities to tweak our ways of living on this planet in a wiser and more compassionate way. The choices we make now can have long-term effects on our well-being. ❑

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Sustainable Health

Rujuta Diwekar

Health is a primary right, a human rights issue really. Education, poverty and gender have an impact on our health outcomes. Where we live, accessibility to health care, clean air and fresh produce and a multitude of other factors affect our health too. Newcastle, a charming university city in the UK, had a very interesting study that showed that people who lived in an area called Byke performed badly on health parameters than those who lived in Jesmond. Byke is a poor area, Jesmond a posh neighbourhood. Your postcode or PIN code as we call it in our country, is now emerging as a critical aspect in influencing our health. And this is irrespective of the country you live in. In cities, it's much more important as ghettos or poorer parts of any city bear the maximum burden of ill-health.

In modern history, the only country to have lost weight collectively (average of all adults) was Cuba. This was in early 90s, the Soviet Union had collapsed and the average consumption of calories by Cubans fell from 3000-3200 to about 2400. Embargo from the US led to food and fuel shortage and even the public transport buses stopped running. Castro declared it as a *periodo especial* (special period). It included food rationing, promotion of small scale gardening and distribution of more than a million Chinese made cycles. Not surprisingly, people lost weight (5.5 kg on avg) and national averages for Diabetes and heart disease dropped. This phenomenon even made it to the British Medical Journal (BMJ), highlighting how eating lesser and moving more could be used as a population-based intervention.

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Metabolically-healthy Obese

One of the many problems with making weight loss as the sole marker for good health is that it completely ignores the concept of metabolically healthy obesity. Not everyone who is overweight or obese is unhealthy or prone to diseases. In fact, about 25-30% of obese people are perfectly fit and healthy otherwise. Their chances of getting any of the NCDs is just about 20%. However, the most common advice they receive is to lose weight and lose weight quickly. And when they lose weight quickly through diet trends described above, not only does the weight come back (80% of all weight loss attempts end in gaining weight back), but most importantly, now they are no longer metabolically healthy obese (MHO).

Now, they have a 150% higher chances of getting diabetes, cancer, heart disease, hormonal imbalance, mental health issues, etc. They are now metabolically unhealthy obese (MUHO).

But as the Cuban economy started picking up in 2000s, obesity rates tripled from 1995 to 2011. Food and fuel was back, so were the rates of diabetes and heart disease. But ask any Cuban would they like to go back to the 90s and they would never ever want to live that time of their life again. Even the authors who wrote about this in BMJ concluded that the 90s tragedy was man-made (by International politics) and that it should never happen again to any population. They even acknowledged the Cubans for the dignity and courage with which they faced the social and economic challenges of the special period.

Long story short, the only way to improve health without an economic or security crisis is to take the more sensible and sustainable route towards it - education, advocacy, self-regulation. It's not about losing weight, it's about doing it the right way, the sustainable way.

Here are 3 easy to understand and practical rules to get on the path of sustainable health –

Metabolic health over weight loss

The basic premise of all diet trends, regardless of their name is – weight loss. Sometimes outright, sometimes garnished with words and concepts like detoxify, rejuvenation, anti-diabetes, anti-cancer, etc. But for any diet trend to thrive, weight loss is the central pillar. Ever heard of a viral diet trend whose only promise is 'food security for all' or even a modest one like 'better digestion and no acidity'? The trillion-dollar food industry needs our focus to stay on losing weight for it to stay profitable.

> One of the biggest reasons for deteriorating public health, even when diet trends proliferate, is the single-minded focus on losing weight at the cost of metabolic health. The narrative of what accounts for good health therefore must shift from weight loss to metabolic health.

But what we notice in our daily lives, if we pay attention, is that the things that really matter when it comes to our well-being, are usually the ones we can't measure on a weighing scale or on a scale of any kind. Do we sleep well in the night, do we wake up feeling fresh, do our energy levels stay good through the day, do we suffer from acidity, bloating and indigestion, do we get sweet cravings post meals, are we able to stay active and comply to exercise plans and do we have painful PMS and periods, etc.

In scientific terminology, the above parameters are surrogate measures of metabolic health. They give an indication of how well your hormones are behaving, how is your heart health, how diverse is your gut bacteria, are your blood sugars well regulated, and so much more. In other words, they are markers of your susceptibility to non-communicable diseases (NCDs) like diabetes, cancer,

Health as per Yoga and Ayurveda

Health is not just about the absence of disease, but rather the presence of youthful enthusiasm and an ability to learn at every stage in life. It encourages one to be on – and stay on – a path of happiness and fulfilment. The Upanishads describe *sukha*, or happiness, as a state where all our senses – sight, smell, touch, sound and taste – are all aligned with one another. *Dukha*, on the other hand, is a state where the senses are not aligned and is, naturally, the lack of happiness. Each of us has experienced this: the body in one place, the mind in another and the senses distraught. This lack of alignment is what the modern world calls 'stress'. In Ayurvedic terms, 'health' can be translated as *swasthya*, a state where the *swa* (the self), is *stha* (centred). In other words, health is synonymous with the state of being centred, with all senses aligned – or as Mahatma Gandhi described it, a confluence of thought, speech and action, and no conflict between them. Yoga, for one, guides us to health on the path of *shanti*, or peace, and the yoga texts teach us that *swasthya* is step one to both inner and outer peace.

Eat Local, Think Global

The world today is fatter than what it was just 10 years ago and yet the dangers of hunger loom over us just as much as they did years ago. Globally, we are facing what is called as, the double burden of malnourishment. On the one hand is a population that eats so much that they could die because of the excesses and on the other hand is a population that doesn't have access to 3 square meals a day.

PCOD, thyroid conditions, heart health, mental health issues, etc. And remember, NCDs account for almost 75% of early deaths worldwide. We all also now know the role comorbidities play in severity of Covid-19 symptoms.

One of the biggest reasons for deteriorating public health, even when diet trends proliferate, is the single-minded focus on losing weight at the cost of metabolic health. The narrative of what accounts for good health therefore must shift from weight loss to metabolic health.

All-round over One-dimensional Approach

Once we move beyond weight loss, we discover that there are many aspects of a fit body – hormones, organs, bones, muscles, ligaments, tendons, joints, skin, hair and so much more. And that they don't work in isolation but are dependent on each other. It then becomes obvious that for the whole of us to stay healthy, a wholesome approach is necessary. One that accounts for all of the above and doesn't work in isolation on any one aspect. So, no diets which come with a tagline – no exercise necessary just walk; no exercise regime which says – eat anything just burn it all; no lifestyle which doesn't account for the need to sleep and recover. Food, activity, exercise and sleep together make for an all-round approach to sustainable health. And an all-round approach is necessary towards each of these aspects too – food not to be broken into carbs, proteins and fats; activity and exercise not restricted to walking or cardio; sleep and recovery on a daily basis and not weekend lie ins.

Also, the daily constraints that life brings in, i.e. your work, travel, family responsibilities, etc., have to become part of the solution and any diet or exercise pattern that doesn't account for them is bound to not succeed. Typical examples are of professions which require mental or physical effort through the day and their poor performance on low-calorie/ deprivation diets.

Long term over Short term Solutions

The other aspect of sustainable health, one which is built into the meaning of the word sustainable, is the concept of long term health. Every time you make a food choice or a decision to follow a certain diet trend or lifestyle, the first question you should ask yourself is – can I continue to do this for the rest of my life? Will this
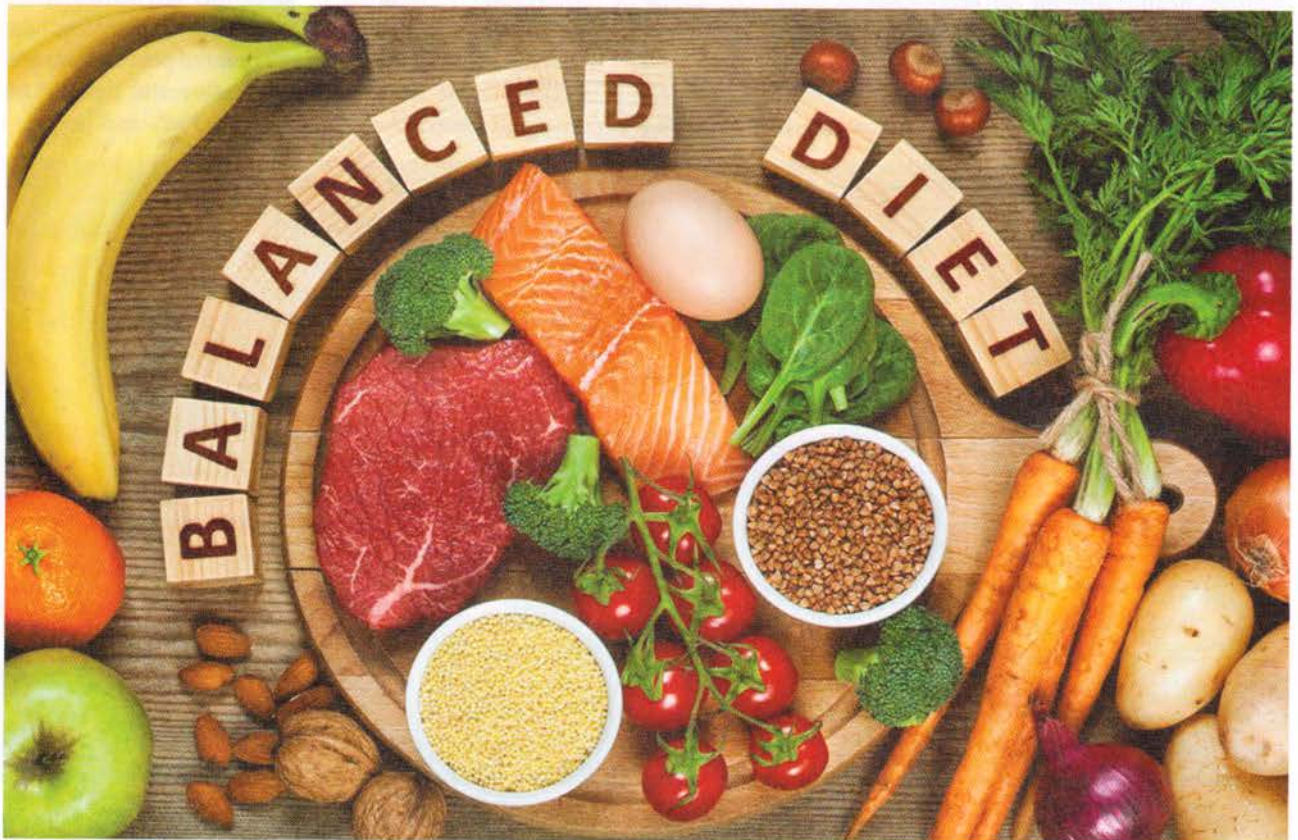
leave my environment, my planet in a better way off or worse for the next generation? If that sounds too much to comprehend, what about next 15 years or even 5 years? If not, you should rethink why you want to do this? Is it for quick weight loss? We already know how harmful that is, so what else? And if you don't find a good enough reason to do a short-term diet or routine, just don't.

Although the human body is not designed to respond well to short term measures, our brain on the other hand, finds it very difficult to comprehend long term and is more interested in immediate rewards. This is what the weight loss industry uses to its benefit and the only way is to constantly remind yourself not to fall for the trap. Quick results, usually used as proxy for quick weight loss, can and mostly do lead to slow deterioration in the body, sometimes irreversible. We usually don't make the connection between that month long liquid diet we did 5 years ago and the damage to the liver that shows up now.

This issue surely deserves the attention of the governments, need serious policy changes and more importantly advocacy for local food and food systems. And this is where each one of us can contribute individually. You must have noticed that Kashmir to Kanyakumari, Bangalore to Boston, and every airport serves the same food from the same big food chains. The burger, the pizza, the coffee chains dominate and even after a long hunt, a restaurant that serves local food or even a local beverage is hard to come by. And it's exactly this uniformity in eating across the globe post the industrialization period that is the leading cause of obesity and now, as scientists are beginning to realize, even of the climate change.

Local food is climate resilient. It blends into the local food systems and grows in a manner that allows for other crops and the surrounding eco-system of fruits, flowers, insects, bees, etc., to flourish. Its nutrient rich and by default a culture fit for the population of that land. It makes economic sense too, as it allows small farmers to grow local food without heavy investments (and unpredictable returns) into bio-technology, modified seeds and even labour. All in all, it helps keep the people, their land and their forest in a good shape.

Essentially it's about going back to the wisdom of our forefathers, of eating local, seasonal and traditional. ❑

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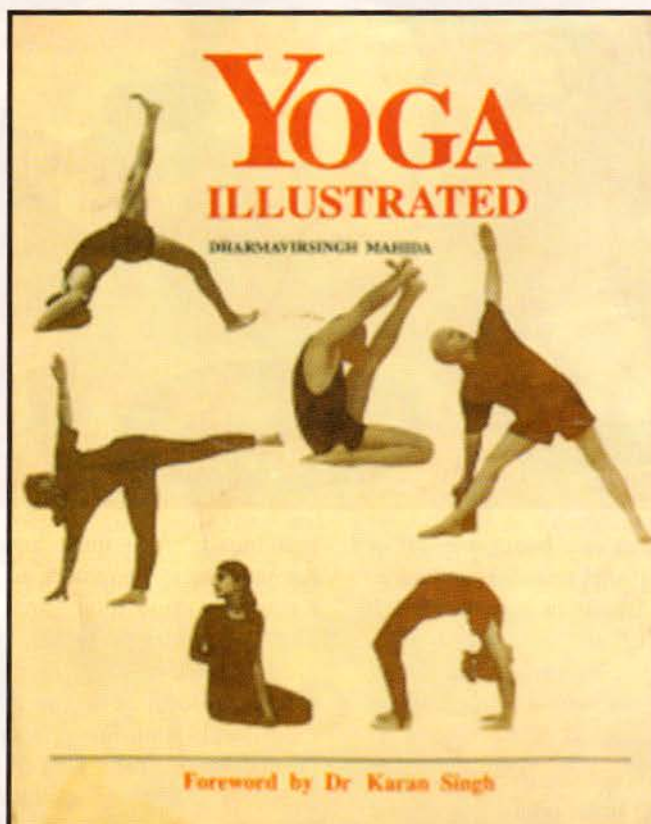
Yoga Illustrated

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The Yogi is superior to the performers of penance.
He is also deemed superior to those who have
attained true knowledge. He is considered greater
than the performers of actions as per the scriptures.
Therefore, Arjuna follow the path of a Yogi.

- (Bhagwat Gita VI. 46)

All the orthodox systems of Indian philosophy have one goal in view, the liberation of the soul through perfection, which is achieved only through direct perception. Literally, Yoga means union. Generally, the word is used for the union of the individual self with the Supreme Self, that is the realization of God. It is to be understood as the integration of Karma Yoga, Gnyana Yoga, Bhakti Yoga and Raja Yoga. Thus, in a wide sense, Yoga signifies spiritual discipline.

The Aphorisms of Patanjali are the highest authority on Raja Yoga. The system of Patanjali is based on the system of Sankhya. The importance of Yoga Sutra is such that even Sage Vyasa thought it necessary to write a commentary on it. It stands between the total devotion of Vedanta and atheistically inclined Sankhya. Systems like Nyaya and Vaisheshika have mentioned Yoga Sadhana.

In 'Yoga Vashishta', Sage Vashishta explains and elaborates Yoga to Sri Rama. Sankhya Yoga has also been mentioned in the Upanishads and Vedas. Sankhya Yoga forms an important part of the Bhagwad Gita. There are numerous scholarly works already in existence on these subjects.

Definition of Yoga

This word has many meanings. But what concerns us, is the meaning 'TO JOIN'- to join the body to the mind and together join to the Self (soul). What also concerns us is Yoga as a system of Philosophy. Sage Patanjali in his Yoga Sutras defines Yoga as "Chitta Vritti Nirodha" - That which restrains the thought process and makes the mind serene. The fluctuations in the consciousness are restrained. Simplified, it means penetrating to inner levels, from gross to subtle. It signifies the complete course of action upto its ending in spiritual absorption.

How to achieve this?

According to Sage Patanjali, this is to be achieved by practice of eight fold path known as Ashtanga Yoga. They are Yama, Niyama, Asana, Pranayama, Pratyahara, Dharana, Dhyan and Samadhi.

The eight limbs of Yoga

Yama

Ethical Disciplines - They are five. Ahimsa: Non-violence in thought, word and deed. Satya : Truthfulness in thought, word and deed. Asteya : Non - stealing. Not even the desire to possess what someone has. Brahmacharya : Continence - behaviour in thought, word and deed which leads to Brahman. Aparigriha : Not to hoard, non - receiving.

Niyamas

Observances. They are five. Saucha: Purification. Internal and External. Santosha : Contentment. Tapas: Fervour, burning desire, inner zeal. Swadhyaya : Study of sciences of the Self. Ishwara Pranidhan : Surrender to God.

Thus, Yama and Niyama form the foundation of Yoga practice. They are to be followed at every moment of one's life. The advantages of following these are very well enumerated in Yoga Sutras.

Even for those who claim not to follow a spiritual path, these ethical observances along with Yoga, build the person's character and free his mind of doubts by helping him to discriminate between right and wrong. They keep him mentally and physically healthy and along with single pointed attention (Ekagrata) they take him towards success in any endeavour.

Asana : Postures

An Asana is meant to bring consciousness to particular regions of the body so that the cells of those regions get activised to become more sensitive and thus play a role in harmonising the whole human system. It involves toning and tuning our body to help the mind play the eternal symphony. The human system being very complex, needs many different postures to achieve this goal. The sensitivity which we have on the tip of our index finger is

Inviting ideas to celebrate the
International Day of Yoga at home
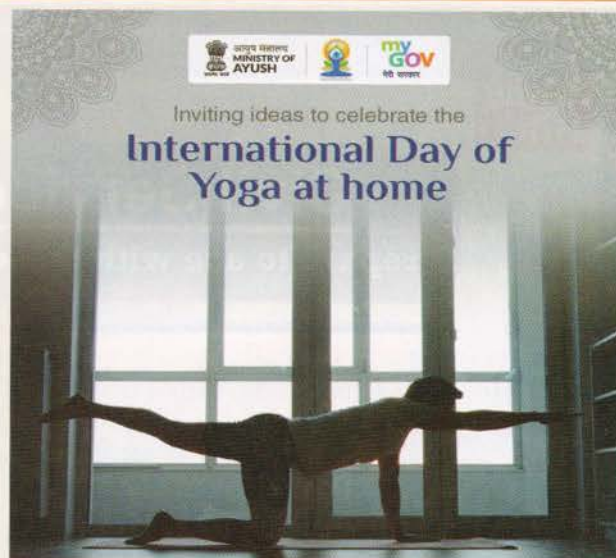
the type of sensitivity, a Yogi has throughout his body. But we have to start initially at a gross level.

Pranayama

It means regulation of breath or bio energy. Prana means energy in different forms or life force. Yama means to extend and regulate, to be able to control. Man lives as long as breath is there. Therefore, it is the Prana which controls breath and life. In Pranayama, one extends, prolongs or pauses in inhalation, exhalation and retention. When the breath is stilled, mind and consciousness (chitta) are also stilled. Mind and Prana are closely related. Hence, by controlling the Prana the mind gets controlled indirectly. Even in the Bhagwad Gita it is conceded that though it is very difficult to control the mind, it can be controlled through practice and dispassion.

Pratyahara

It means restraining or withdrawal of senses. There is no interest left in external objects, resulting in total withdrawing towards the Self. This comes only through integration of other stages of Yama, Niyama, Asana and Pranayama when well practiced. With this, the bahiranga sadhana (external quest) ends, according to Patanjali.

Dharana

It is the state of total concentration where all the energies are channelised to a single point. Future, past and present become one. Dharana, Dhyan and Samadhi are known as Antaranga Sadhana (Internal Quest).

Dhyan

In Dhyan, the dharana stage is prolonged or continued. Its reflection thus becomes meditation. It is in this state that one achieves a pure conscious state, paving the way for culmination into **Samadhi** - Superconscious state. ❏

Excerpts from the book Illustrated Yoga published by Publications Division.
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Smart Agriculture

Ankita Sharma

Agritech is defined here as technologies and tools that improve yield, efficiency and profitability by leveraging Internet of Things, big data, artificial intelligence, machine learning, drones, and sensors in agricultural processes to track, monitor, automate and analyse. Using predictive technologies to detect erratic weather, sensors to map the specific type of climate and soil in an area, and machine learning algorithms that determine the appropriate crops based on this data, can substantially improve the quality and quantity of yield. In the dairy and livestock vertical, the use of sensors to monitor the health and nutrition of cattle and drones to track herds can improve efficiency and traceability.

Agriculture and allied sectors are the primary source of livelihood for nearly 55 per cent of India's population (Census 2011) but accounted only for approximately 17.8 per cent of the country's Gross Value Added (GVA) in 2019-20[1]. The yields on cereal crops are about 50 per cent lower in India, than in countries such as the United States or China[2], and speak to the numerous structural barriers that continue to persist in the sector. With agricultural output being utilised as important input for various industries, including retail and e-commerce, the importance of agriculture and improving yields becomes all the more pressing.

The average size of farm holdings in the country is just over 1 hectare, with small and marginal farmers holding nearly 86 per cent of the total[3]. Small holders find it particularly difficult to invest in expensive technologies and other inputs that would improve efficiency. Additionally, the existence of a large number of intermediaries across the value chain, challenges in access to credit and technology, limited sales channels, and lack of digital infrastructure have inhibited agricultural potential. These distinctive attributes of the agriculture sector in India have made it imperative to look towards policies that improve yield, simplify value chain networks, democratize digital infrastructure, and improve access to credit and insurance.

An important solution lies in the rapid adoption of agritech, defined here as technologies and tools that improve yield, efficiency and profitability by leveraging Internet of Things, big data, artificial intelligence, machine learning, drones, and sensors in agricultural processes to track, monitor, automate and analyse.[4]

The rationale behind the use of such emerging technologies is to minimise the impact of the 'unknowns' of agriculture. For instance, weather, soil and climatic conditions have historically been

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Central Government Initiatives	State Government Initiatives	
Soil Health Cards (2015-2017): crop-specific recommendations for fertilizers and nutrients, every two years.	Karnataka	Agritech fund of USD 2.5 Mn using AI. Partnership with IBM to price forecasting using AI and ML.
Soil Health Card Mobile App (2017): captures GIS coordinates while registering sample details to indicate location of sample.	Haryana	Integrated Farmer Producer Organization's (FPO) packhouses to the eNAM platform.
National Agriculture Market - eNAM (2016): electronic trading portal connecting APMC mandis. Incorporates 1,000 markets with over 90 commodities.	Madhya Pradesh	Set up the UN-ICRISAT agency to assist with climate smart agriculture solutions.
	Uttar Pradesh	Bill and Melinda gates Foundation and TATA Trusts collaborated with the State government to set up an Indian Agriculture Incubation Network at IIT Kanpur.
	Telangana	Open Data Portal, containing 199 datasets including agriculture, irrigation, and animal husbandry and livestock.
	Punjab	Collaboration with Israeli farming solutions organization, ARNA, which provided affordable technical skill training to farmers to boost crop yield, income, and diversify crops. The company also provided a state digital agriculture platform with a database of all farmers to track their agriculture activities.
Direct Benefit Transfer: Around 14 schemes in agriculture and 2 in animal husbandry have been rolled out using DBT, which involved use of Aadhar-based biometric authentication and ePOS machines to directly reach the farmers' bank accounts.	Rajasthan	Hosted agri-meets, and a Challenge for Change platform for Agritech entrepreneurs.

an important determinant of the agricultural processes in India. Using predictive technologies to detect erratic weather, sensors to map the specific type of climate and soil in an area, and machine learning algorithms that determine the appropriate crops based on this data, can substantially improve the quality and quantity of yield. In the dairy and livestock vertical, the use of sensors to monitor the health and nutrition of cattle and drones to track herds can improve efficiency and traceability.

The agritech space in the country involves various actors, including think-tanks, research laboratories, government, incubators, and startups. The Central as well as various state governments have undertaken numerous initiatives to enable and support the integration of smart technologies in agriculture. A few of these initiatives have been outlined.

Small holders find it particularly difficult to invest in expensive technologies and other inputs that would improve efficiency. Additionally, the existence of a large number of intermediaries across the value chain, challenges in access to credit and technology, limited sales channels, and lack of digital infrastructure have inhibited agricultural potential.

Recognising the growing necessity in the country for the integration of such solutions, agritech startups have been driving innovation towards bridging the various gaps that persist along the value chain. Acting as the link between farmers, wholesalers, retailers, and consumers, these startups have been improving market linkages, while disrupting traditional agricultural systems with innovative and affordable solutions. There are over 500 agritech startups in the country[5], which witnessed a significant rise with the government's Digital India campaign that has prioritized the creation of digital infrastructure for all. Some notable agritech startups which are utilizing cutting-edge technologies to drive solutions in the sector include Fasal, DeHaat, Clover, CropIn, and Intello Labs.

Even as the various stakeholders are driving smart agriculture in India, certain fundamental issues must still be addressed to effectively bring about this digital revolution. These include the issuing of blanket solutions as opposed to localised recommendations which are sensitive to geographical, socio-cultural, and demographic requirements, the fragmented and unorganised structure of agriculture that involves multiple levels of intermediaries, the hesitation of small holders to undertake technologies that would not be commercially viable and cost-efficient. Additionally, even with the launch of initiatives such as Digital India, the adoption and

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penetration of technology is a slow process that diminishes investor interest. The lack of synergy between the various advisories and their disconnect from on-ground situations also perpetuate low uptake of smart technologies.

Therefore, the process of unleashing the true potential of agritech in the country would involve developing a synergistic relationship between the various stakeholders in the process, including the farmers themselves, enhancing investment and R&D to constantly improve and update solutions, and further improving the regulatory environment to ease accessibility of startups and other companies to create a robust ecosystem. ❑

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5. https://www.entrepreneur.com/article/366366

MIS module for strengthening domestic Agarbatti industry

National Bamboo Mission has launched an MIS (Management Information Systems) based reporting platform for agarbatti stick production to collate the locations of stick making units, availability of raw material, functioning of the units, production capacity, marketing, etc. With the help of this module, the linkages with the industry will be synergised better to enable seamless procurement from production units and information gaps can be plugged. All NBM States are documenting all the units to assess better how further support can be given for 'Vocal for Local' and 'Make for the World' since Indian agarbatti are much sought after in global markets.

National Bamboo Mission (NBM), Ministry of Small and Medium Enterprises (MSME), Khadi and Village Industries Commission (KVIC) schemes as well as States, together with industry partners have stepped up focused support to enable India to become Atma Nirbhar in the agarbatti sector, to bring back livelihoods for the local communities while modernising the sector too. The agarbatti sector traditionally provided large scale employment to the local workforce, which however dwindled due to various factors including the ingress of cheap imports of round sticks and raw batti. A comprehensive study was carried out by NBM in 2019 following which policy measures taken by the Government of moving raw batti imports from free to restricted category in Aug 2019 and increasing import duty on round stick uniformly to 25% in June 2020 came as a boost to the domestic units.

Background of NBM

The restructured National Bamboo Mission (NBM) was launched in 2018-19 for holistic development of the bamboo sector through a cluster-based approach in a hub (industry) and spoke model to harness the opportunities by providing backward and forward linkages among the stakeholders – linking farmers to markets. There is a huge potential to place Indian bamboo products in the domestic as well as global markets with the latest technologies, modern processing and by generating awareness on compliance requirements for destination countries. The Mission is streamlining its interventions to enhance domestic industrial activities and augmenting the farmer's income with support from technical agencies and facilitative steps. Direct subsidy of 50% is given to farmers at Rs 1.00 lakh per ha, 100% to Government agencies and also to entrepreneurs for setting up various product development units, etc. The Mission is presently being executed by 21 States, including all the 9 States of NER through the respective State Bamboo Missions. NBM is also advising States to make available quality planting material to the farmers out to carry out plantations of commercially required species, set up common facility centres and other post-harvest units in complete sync with the requirement of existing and sunrise industries for a win-win situation for farmers and Indian bamboo industry. ❑

E-waste Management

Richa Rashmi

E-waste management is a complicated process given the multitude of actors that are involved in the process. Even though the e-waste management policies are in place since 2011 in India, implementation has been sluggish. As of today, some 95% of e-waste is managed by the informal sector which operates under inferior working conditions and relies on crude techniques for dismantling and recycling.

Electronic waste (e-waste) i.e., waste arising from end-of-life electronic products, such as computers and mobile phones, is one of the fastest growing waste streams in the world today. The world dumped a record 53.6 million ton (Mt) of e-waste in 2019, recycling only 17.4% of it (Global E-waste Monitor, 2020).

India has an e-waste management policy in place since 2011, with its scope expanded in 2016 and 2018. Yet, the pace of its implementation has not been satisfactory. Less than five percent of the waste is treated through formal recycling facilities, leaving the rest to be handled by the informal sector with very little enforcement of environmental and occupational safety norms (Government of India, 2019).

E-waste management is limited by both the demand and the supply side factors and requires an in-depth analysis. An attempt is made here to outline key policy measures to improve recycling capacity in India through market-based mechanisms for policy enforcement. In particular, it addresses business solutions for mobile manufacturers as part of Extended Producer Responsibility targets set by the Government of India.

E-waste value chain

E-waste management is a complicated process given the multitude of actors that are involved in the process. The major stakeholders in the value chain include importers, producers/ manufacturers, retailers (businesses/ government/ others), consumers (individual households, businesses, Government and others), traders, scrap dealers, dissemblers/ dismantlers and recyclers (UNEP, 2007). To critically assess each in the different stages of processing, it is important to understand the e-waste value chain. The process involves four stages - generation, collection, segregation and treatment/ disposal (The Electronics Recycling Landscape, 2016).

E-waste is generated when the first user of the product concludes on its useful life with no intention of reuse and disposes it off by donating or selling. This e-waste can be managed either formally through collection or disposal in waste bins or informally through developed e-waste management infrastructure or even without it. (Global E-waste Monitor, 2020).

Formal Collection

The activities usually fall under the requirements of national e-waste legislation, in which e-waste is collected by designated organisations, producers, Government (such as municipal collection sites), retailer take-back, and producer take-back. This e-waste is then taken to a specialised treatment facility, which recovers the valuable materials and manages the toxic substances in an environmentally controlled manner. Residuals are incinerated or safely landfilled.

Waste Bin Collections

The disposer resorts to openly dump the product in a waste bin along with other household wastes. Since segregation of such waste is rudimentary, the e-waste ends up being incinerated or landfilled as other domestic waste. As a result, besides losing the resource value it harms the environment.

Informal Collection

Some countries may have an established network of individual waste dealers or companies who collect

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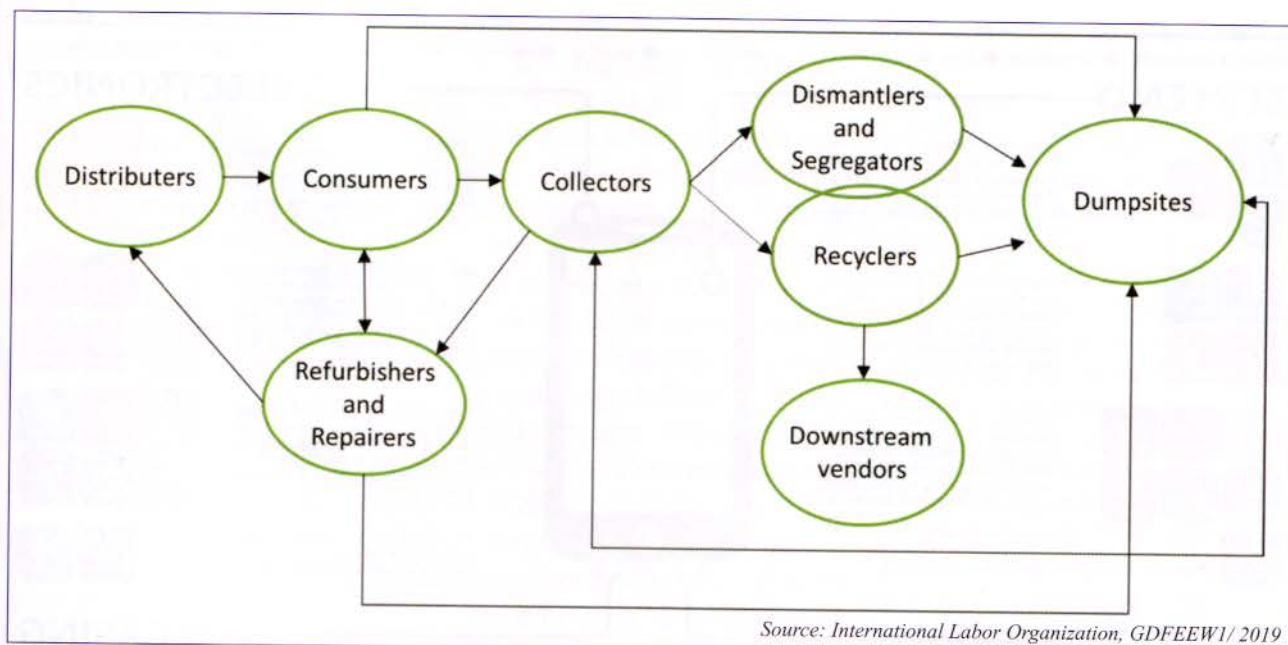
Figure 1: Informal Value Chain Source: International Labor Organization, GDFEEW1/ 2019

and trade the e-waste through various channels wherein possible metal recycling may occur at the destination. In others, the e-waste may be picked door-to-door and sold to an informal dealer who may repair, refurbish, or sell again to a backyard recycler. This recycler dismantles the product through burning, leaching, and melting, thus converting it into secondary raw materials. Irrespective of how the e-waste is disposed of in the two processes, it still runs the risk of not being aptly treated to secure the disposal in an environmentally sound manner. The general structure of an informal value chain is depicted in Figure 1.

India's regulatory ecosystem:

Indian electronics sector boomed in the last decade, picking up from US$ 11.5 billion in 2004-05 to US$ 32 billion in 2009-10 (Paliamentary Proceedings, 2010). Increased production and penetration of imported electronics items led to an accelerated e-waste generation that necessitated regulatory control over the sector. Besides, because of the high cost of recycling e-waste (companies have to pay for disposal of broken equipment), many companies in developed nations opted for the less expensive option, i.e. to ship their e-waste overseas to dump in developing nations.
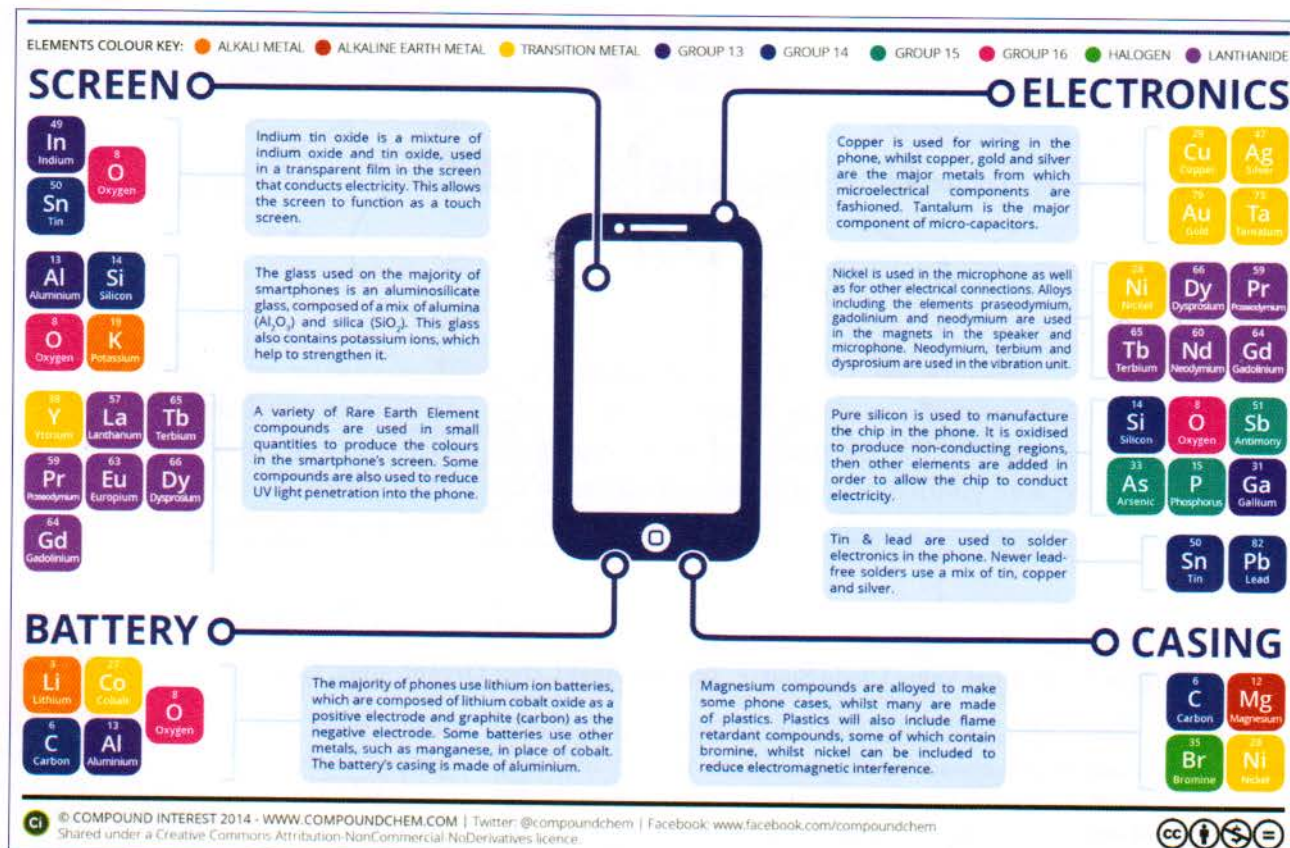
This prompted many awareness-raising campaigns by non-governmental

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organisations (NGOs) and greater attention from multilateral institutions leading to introducing general waste management regulations in 2008 by Government calling for responsible e-waste management. The Government also started focusing on formalizing the electronics recycling industry by issuing registrations and e-waste management guidelines[1], following suggestions by industry associations like Manufacturer's Association of Information Technology (MAIT). To streamline e-waste management, Government notified Electronic Waste (Management and Handling) Rules 2011, introducing Extended Producer Responsibility (EPR), whereby producers were required to collect and recycle electronic items. By shifting the burden of waste management onto manufacturers, the EPR framework, in theory, created incentives for more environment-friendly product designs. Since manufacturers were incurring the disposal cost, their designs would incorporate less toxic and easily recyclable materials, thereby reducing input material requirement. Meanwhile, the electronic waste generated in India had climbed from 1.7 Mt in 2014 to 1.9 Mt in 2015 (United Nations, 2015 & 2016).

A deeper analysis revealed that the EPR regulations in India were not quantified through collection or recycling targets as in other countries with better implementation framework

ELEMENTS COLOUR KEY: ● ALKALI METAL ● ALKALINE EARTH METAL ● TRANSITION METAL ● GROUP 13 ● GROUP 14 ● GROUP 15 ● GROUP 16 ● HALOGEN ● LANTHANIDE

SCREEN

Indium tin oxide is a mixture of indium oxide and tin oxide, used in a transparent film in the screen that conducts electricity. This allows the screen to function as a touch screen.

The glass used on the majority of smartphones is an aluminosilicate glass, composed of a mix of alumina (Al_2O_3) and silica (SiO_2). This glass also contains potassium ions, which help to strengthen it.

A variety of Rare Earth Element compounds are used in small quantities to produce the colours in the smartphone's screen. Some compounds are also used to reduce UV light penetration into the phone.

ELECTRONICS

Copper is used for wiring in the phone, whilst copper, gold and silver are the major metals from which microelectrical components are fashioned. Tantalum is the major component of micro-capacitors.

Nickel is used in the microphone as well as for other electrical connections. Alloys including the elements praseodymium, gadolinium and neodymium are used in the magnets in the speaker and microphone. Neodymium, terbium and dysprosium are used in the vibration unit.

Pure silicon is used to manufacture the chip in the phone. It is oxidised to produce non-conducting regions, then other elements are added in order to allow the chip to conduct electricity.

Tin & lead are used to solder electronics in the phone. Newer lead-free solders use a mix of tin, copper and silver.

BATTERY

The majority of phones use lithium ion batteries, which are composed of lithium cobalt oxide as a positive electrode and graphite (carbon) as the negative electrode. Some batteries use other metals, such as manganese, in place of cobalt. The battery's casing is made of aluminium.

CASING

Magnesium compounds are alloyed to make some phone cases, whilst many are made of plastics. Plastics will also include flame retardant compounds, some of which contain bromine, whilst nickel can be included to reduce electromagnetic interference.

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Shared under a Creative Commons Attribution-NonCommercial-NoDerivatives licence.

Source: Brunning, Andy. Compound Interest[2], 2014

Elements used in a Smart Phone

and mechanisms. In the absence of targets, and in a relatively lax regulatory environment, producers had little incentive to ensure the collection of their used products. This resulted in the e-waste rules being amended in 2016 to include collection targets and implementing a deposit-refund system (DRS) by the producers (Government of India, 2016). In a DRS, an upfront deposit is charged to the consumer at the time of purchase of the product, and the deposit is refunded when the product is safely returned to the producer. The initial targets (collection rate of 30% in the first two years and 70% by the end of seven years) were met with resistance by the industry. Manufacturers lobbied to relax the norms, consequently leading to a reduction in the collection targets (10% in the first two years though still continuing to reach 70% by the end of seven years) through an amendment to the rules in 2018.

The 2018 amendment also made provision for the registration of Producer Responsibility Organizations (PROs). PROs in India offer comprehensive compliance services, from negotiating the most cost[1] effective regional collection and recycling contracts with different recyclers to helping producers meet outreach and awareness raising requirements (CRB and the Green Electronics Council, 2018).

Current scenario and issues in e-waste recycling

Even though e-waste management policies are in place since 2011 in India, implementation has been sluggish. As of today, some 95% of e-waste is managed by the informal sector which operates under inferior working conditions and relies on crude techniques for dismantling and recycling (Government of India, 2019).

Policy changes have tried repeatedly to formalise the sector, but issues of implementation persist on the ground. First is the issue of price competencies. Unlike formal recyclers, informal recyclers have lesser operating costs, no overheads, or other administrative necessities. They hence can offer better price to the aggregators for material, especially high value electronics with precious metals content. As aggregators are again mostly informal, they demand up-front cash payment. Government and multilaterals have endeavored to plug this financial gap through subsidies and monetary support but that has not been a sustainable practice. Second, the informal network is well-established and rests on social capital ties that PROs have yet to establish and are hence insulated from reaching the viable number of aggregators.

Often these disabilities have led to the EPR targets remaining unmet. Gap analysis of why EPR targets

remain short of being met has revealed that the unsteady inflow of new funds from producers to meet their EPR targets, coupled with missing enforcement, transparency, and traceability of e-waste flows has led to perverse market incentives. As a result, a potentially significant amount of e-waste is not being channelled to those who recycle it in an environmentally safe manner.

Another important issue is the lack of sufficient metal processing infrastructure which is why recyclers have to export materials to global smelters and hence never fully realise the true value of extraction, both in terms of processing cost and the price of the extracted metals' quality and quantity. If these materials are domestically isolated, it can lead to greater metals security and resource efficiency in the country (NITI Aayog, 2017).

On the demand side, the major constraint is the awareness level of the consumers both in terms of consumption pattern and disposal pattern. With the enhancement in the standard of living, modern societies have become resource-intensive in their consumption. This has upended the demand for electronic items while considerably bringing down the life cycle of electronic products. Coupled with planned obsolescence by the producers, inadequate repair options or awareness about deposit refund policies, consumers tend to dispose of electronic goods along with other household waste, thus

> **EPR regulations in India were not quantified through collection or recycling targets as in other countries with better implementation framework and mechanisms. In the absence of targets, and in a relatively lax regulatory environment, producers had little incentive to ensure the collection of their used products. This resulted in the e-waste rules being amended in 2016 to include collection targets and implementing a deposit-refund system (DRS) by the producers (Government of India, 2016).**

leading to issues of segregation of products entering the informal market.

Stakeholder Analysis

The demand and supply side gap analysis against the backdrop of the regulatory landscape reveals two major stakeholders in the process – (1) Business advocates and (2) Public and Media gatekeepers. The Government remains a great catalyst in the entire process. Its role can be discounted to be that of a facilitator and a regulator in a self-propelled market. Rather than taking a Keynesian approach of instigating demand for e-waste recycling through levies and subsidy packages (levies and subsidies impose two distinct challenges for e-waste funding policy), a neo-classical growth method triggering increased supply to formal recyclers and closing the infrastructure deficit to improve dismantling and extraction in the country can go a long way in creating the desired market for e-waste recycling. This is where the current policy framework needs to put in efforts and hence, the Government's role is essential.

Technology is becoming increasingly integrated into every aspect of our lives, thus fuelling the demand for electronic products in the market. Meanwhile, the life span of devices is getting shorter with the rapid pace of technological advancements, improved specifications and better performance leading to product replacements much before these run out of their usable periods. It
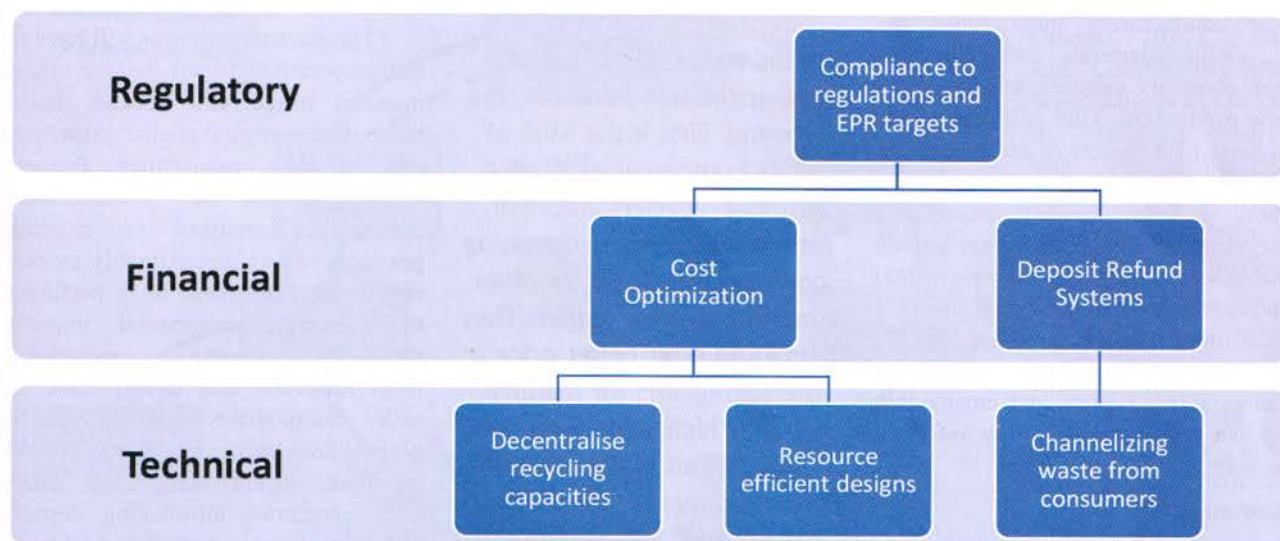
Figure 2: Applying business solutions to e-waste problems Source: Author's compilation

Source: Author's compilation
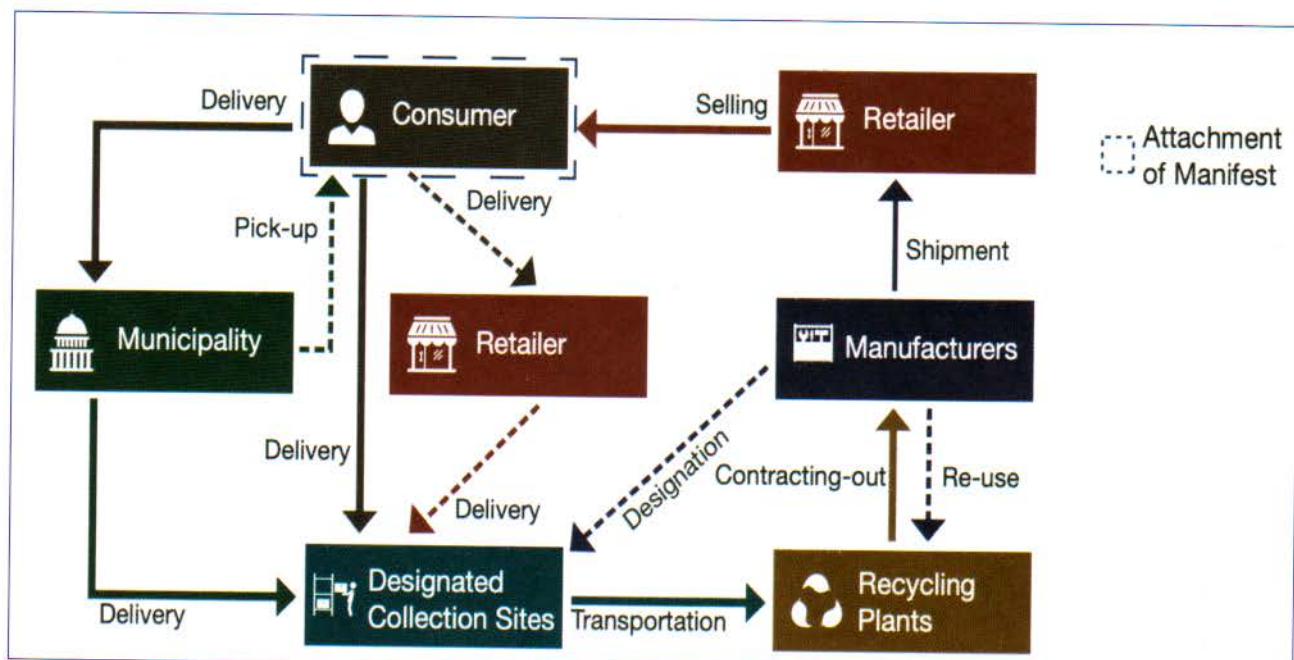
Source: Electricals & Electronics Manufacturing in India, ASSOCHAM-NEC, 2018

Figure 3: E-waste Disposal System, Japan

is important that consumers responsibly consume the product for its useful life and then weigh between the chances of repair or disposal with utmost consciousness towards the environment.

On the supply side, e-waste can be reduced when producers design electronic products that are safer, and more durable, repairable and recyclable. Most importantly, this means using fewer toxic materials. Manufacturing processes that generate fewer material inefficiencies can also lower the overall energy consumption.

Manufacturers must reuse the recyclable materials and not mine rare elements unnecessarily to meet new production. This will drive them to meet EPR targets of collection and run campaigns to educate consumers about in-house e-waste reuse and recycling options. Rather than hoping that informal recyclers become formal and continuing in an ad-hoc manner till such time, it would be more feasible for companies to design programs that can establish tie-ups and ensure that e-waste easily makes its way to formal recyclers.

Recommendations

The issue of E-waste brings us to the crossroads of Malthusian versus Cornucopian views. The

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current business practices of planned obsolescence in the electronics industry have been more in congruence with the Cornucopian view that the resources are plenty and the ability to adapt and adopt designs will compensate for any shortage in a particular resource in the future. The eminent danger that mining of such vast resources of rare, toxic and precious metals pose; and their likely harmful effect on environment and human health puts a big question mark on the efficacies of these industrial practices. The Neo-Malthusian school propounds for sustainable development and encourages recycling.

The electronics sector will have to adapt operations to one, reduce virgin material usage and second, build technologies around greater extraction and recycling capabilities. Process designs should be revolutionized to find alternatives to existing practices to not unsustainably extract rare earth resources. It is pertinent to reduce environmental impacts throughout company operations, from materials and energy used to make commodities right through to global take-back programs for old products. Incentivising such take-back programs, introducing deposit refund systems and trading credits or discounts for the exchange value of products by sector conglomerates will

induce a natural ecosystem of waste collection and disposal. Deposit refund systems can further create inventories of total waste generated and recycling capacity. This guides our supply side gap assessment results and is tabulated in Figure 2. Further, optimising the E-waste recycling chain requires strict monitoring, enforcement and tracking, realization of economies of scale and global cooperation. Failing to address any of these elements will result in suboptimal resource efficiency while posing a risk to the environment. Enforcement of EPR targets and comprehensive monitoring of formal recycling flows and processes is a critical first step to avoid leakage of valuable materials to an uncontrolled informal sector. This monitoring will lead to the creation of a level playing field where all the stakeholders shall be held accountable for their actions during the process of collection, dismantling, processing, extraction, and recycling. Thus, a stepwise approach is essential for optimizing the recycling chain during all stages of the process rather than only at the beginning or the end as the current policy advocates. All the steps involved in the recycling process should be critically benchmarked against international best practices to derive maximum financial, environmental and resource efficiency.

On the demand side, as per the Neo-Malthusian school of thought, it is important to build such collection

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capacities in as decentralized a manner as possible. This has many benefits to its adoption:

1.   It reduces the overall carbon footprint of the recycling facility as the size will be commensurate to local population needs.

2.   Being locally accessible will generate greater usage of the facility and empower people to influence formal market channels of waste collection. This reduces tendencies of recycler monopoly and allows a laissez faire market to operate, which in turn benefits both consumer and manufacturer who can pick from variety of local alternatives to opt for disposing their e-goods. This alone is the strongest approach in tackling waste management issues.

3.   Localisation of recycling facilities also reduces transport and energy cost.

Further, people should be made aware of the trade-offs between sustainability and consumerism through both industry campaigns and media networks. This can also be approached through environmental justice analysis, whereby repercussions of a product entering an informal chain and consequently its effect on vulnerable and most exposed workers in the sequence can be documented and presented to the public. Research and surveys conducted in India have shown that public awareness of e-waste hazards and recycling is low (Borthakur & Govind, 2017). NGOs and community-based organizations can further the cause of ensuring safe disposal practices as well as monitor health and safety adherence by corporates and recyclers.

Conclusion

The size and complexity of the e-waste problem is growing at a much quicker rate than the efficacy of our strategies to contain it. This trend is not likely to reverse soon. One of the viable
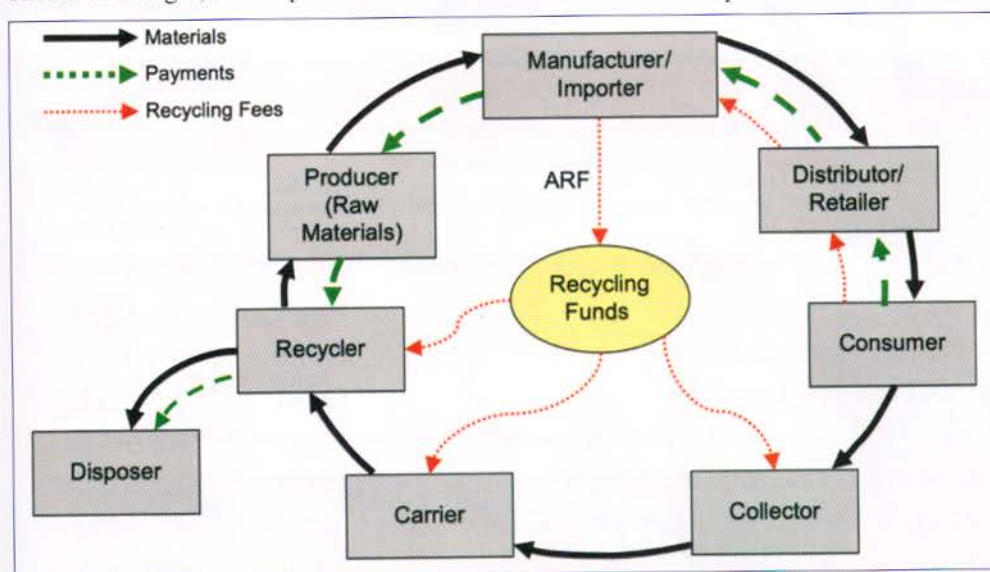
Source: D.S. Khetriwal et al. / Journal of Environmental Management 90 (2009), 153-165

Flow of materials and finances in the Swiss e-waste management system

options to solve the problem is to reduce the generation of waste drastically. Whereas the policy advocates for greater awareness campaigns on the part of producers, it has been sorely lacking in citizen engagement frameworks to encourage responsible consumption and possibly bring down consumption levels altogether. Ministry of Electronics and Information Technology, Government of India, initiated an e-waste awareness program under Digital India Mission in 2016 along with industry associations, to create awareness among the public about the hazards of e-waste recycling by the unorganized sector and to educate them about alternate methods of disposing of their e-waste. Concerted efforts are important to generate a momentum of sustained efforts towards increasing disposal through formal channels and catalyzing sustainable consumption patterns.

Immense potential is there in augmenting e-waste recycling in the country. There are some forward movements in this direction. However, lots of ground need to be covered through awareness campaigns, skill development, building human capital, and introducing technology while adopting adequate safety measures in the country's informal sector. Since India is highly deficient in precious mineral resources, there is a need for a well-designed, robust and regulated e-waste recovery regime that would generate jobs and wealth. The focus of this analysis is to inform policymaking about measures to improve recycling capacity through market-based mechanisms, unlike the current policy approach of subsidy-based efforts. Sustainable business solutions and proactive people's participation can guide the time-bound achievement of EPR targets and breathe a second life for digital debris. ❏

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Multiple Choice Questions

1. **Which one of the following energy is most utilized in biomass?**
   a) Atomic energy
   b) Solar energy
   c) Geothermal energy
   d) Tidal energy

2. **Consider the following statements:**
   Assertion (A): Ecological productivity decreases from the equator towards the poles.
   Reason (R): Insolation rapidly decreases from the equator towards the poles.
   Select the correct answer from the codes given below:
   Codes:
   a) Both A and R are true and R is the correct explanation of A.
   b) Both A and R are true but R is not the correct explanation of A.
   c) A is true but R is false.
   d) A is false but R is true.

3. **It is suggested by the doctors that the person suffering from prostrates in the kidney or gallbladder should not consume excessively the food stuffs like tomatoes, eggs, milk etc which are the major causes of the crystal formation as the prostrates, which is made of:**
   a) Calcium phosphate
   b) Calcium oxalate
   c) Calcium chloride
   d) Calcium sulphate

4. **In a forest, deer, raccoons, squirrels, and other animals eat and find shelter. A detritus food web occurs as their wastes accumulate on the forest floor. In this detritus web:**
   a) Deer and raccoons function as the producers
   b) Fungi and earthworms function as producers
   c) Decomposers function as consumers
   d) The deer and raccoons represent decomposers

5. **A sample of chloroform before using as an anaesthetic, is tested by**
   a) Fehling's solution
   b) Ammonical cuprous chloride
   c) Ammonical silver nitrate solution
   d) Silver nitrate solution after boiling with alcoholic KOH

6. **In a rural hilly district in Himachal Pradesh, a land developer uses bulldozers to clear all but the largest trees and cleans up a nearby stream, lining the bottom** of the stream with pretty park-like setting around his home. We expect that in this cleared yard, there will be:
   a) More species of invertebrates in the stream and on the land but fewer species of vertebrates and plants everywhere
   b) More mammal and plant species, but fewer birds and invertebrates on the land and in the stream
   c) Fewer species of vertebrates and plants everywhere but more invertebrates in the stream
   d) Fewer species of plants, invertebrates, and vertebrates everywhere

7. **Living in the atmosphere of CO is dangerous because it**
   a) Reduces organic matter of tissues
   b) Dries up the blood
   c) Combined with O_2 present inside to form CO_2
   d) Combines with haemoglobin and makes it incapable of absorbing oxygen

8. **The partnership for Action on Green Economy (PAGE), a UN mechanism to assist countries transition towards greener and more inclusive economies, emerged at**
   a) The Earth Summit on Sustainable Development 2002, Johannesburg
   b) The United Nations Conference on Sustainable Development 2012, Rio de Janeiro
   c) The United Nations Framework Convention on Climate Change 2015, Paris
   d) The world Sustainable Development Summit 2016, New Delhi

9. **The target to reduce Infant Mortality Rate [IMR] during eleventh plan period was kept at**
   a) 27 per 1000 live birth
   b) 28 per 1000 live birth
   c) 29 per 1000 live birth
   d) 30 per 1000 live birth

10. **Which one of the following adopted "Agenda 21"?**
    a) First Earth Summit
    b) Summit on Sustainable Development
    c) Montreal Protocol
    d) Kyoto Protocol

ANSWERS KEY : 1. (b), 2. (a), 3. (b), 4. (c), 5. (c), 6. (b), 7. (d), 8. (b), 9. (b), 10. (a)

Home Isolation in Mild Covid-19: Do's and Don'ts

Most people who catch Covid-19 would recover after experiencing either no or mild symptoms. Such patients need to isolate themselves at home, to both protect themselves and avoid spread of infection. The Government has been updating the clinical guidance for home isolation, based on evolving pandemic situation and clinical knowledge.

Following are the do's and don'ts that will be helpful especially for health professionals and care-givers and those getting infected and having to undergo home isolation.

1. Home isolation helps free hospital space and contain spread of disease in restricted environment.

2. Mild disease means disease in which there are only upper respiratory tract symptoms which means no shortness of breath. Only patients having mild disease are recommended for home isolation. The decision about whether it is mild will be taken by doctor.

3. The availability of requisite facility with attached separate bathroom at the residence for self-isolation should also be considered.

4. Immunocompromised patients like HIV positive people are not recommended for home isolation and can be allowed home isolation only after proper evaluation by doctor.

5. Elderly patients with comorbidities shall only be allowed home isolation after proper evaluation by the treating doctor.

6. Patients should have caregiver on 24X7 basis.

7. Caregiver should have link with hospital for entire duration of home isolation.

8. Treating physician should be kept updated regarding worsening symptoms. Patient should continue medications for comorbid conditions. He/she should be hydrated and well rested. Antipyretics should be consumed as per doctor's prescription.

9. Monitoring of symptoms is the most important segment in home isolation. Patients should make use of pulse oximeter and should promptly report any deterioration of symptoms.

10. Patients must stay in an identified room with attached bathroom which should have cross ventilation. They should stay away from other family members, especially the elderly and should not share personal items with other members.

11. Patient should use triple-layer medical mask all the time which should be discarded after 8 hours of use. It should be disinfected with sodium hypochlorite before discarding.

12. Regularly touched surfaces like table-top, door knobs should be cleaned with 1% hypochlorite solution or phenyl. Alcohol-based sanitisers are not recommended for disinfecting surfaces.

13. Caregivers should wear triple-layer mask within the house. They should ensure hand hygiene before and after wearing mask and also after contact with patient and his/her immediate surroundings. They can use soap for 40 seconds or alcohol-based hand rub. Caregiver should avoid direct contact with secretions of the patient.

14. Potentially contaminated items in immediate environment of patient should be avoided. Food must be provided to the patient in his/her room. Utensils and dishes used by the patient should be cleaned with soap and detergent.

15. Patients should follow the instructions regarding physical distancing, mask use, handwashing, self-monitoring, and constant contact with healthcare provider.

16. For symptomatic management patient may perform warm saline gargles twice a day, steam inhalation for a few minutes may also be done. Patient can also consume vitamin C and zinc tablets.

17. The decision to administer remdesivir should be taken only by medical professional. Patient should not attempt to procure or administer remdesivir at home. Oral steroids should not be taken in mild disease. Only doctor can take decision about low dose of oral steroids if symptoms persist beyond 7 days.

18. Patients should seek help of hospital if they develop difficulty in breathing or oxygen saturation goes below 94%; also, if they feel persistent pain in the chest or mental confusion or inability to rise.

19. Patient under home isolation will stand discharged and end isolation after 10 days of symptom onset or if there is no fever for 3 days. There is no need for testing after the home isolation period is over.

20. Caregivers can take hydroxychloroquine.

21. For patients who are borderline hypoxic, proning is recommended to increase oxygen saturation by two to three points to avoid panic order stress. ❑

Source : PIB