1-15 APRIL, 2020

Down To Earth

FORTNIGHTLY ON POLITICS OF DEVELOPMENT, ENVIRONMENT AND HEALTH

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Corona challenges today and tomorrow

I AM WRITING this from lockdown—India is at the cusp of coronavirus' third and most deadly stage of community transmission and governments have now called out to citizens to stop all economic activities and isolate themselves. This is clearly crucial. Never before—at least not in my living memory—has something this small become so globally life-threatening and so out of control, so quickly.

It was only in January that we got the first real news about the novel virus, which has jumped from animals to humans, and was claiming lives in China. We saw images of forced incarceration; millions of businesses and homes were shut down; hospitals were built overnight; and, it would have seemed that victory was on hand. It was a blip in the global economy and China would bounce back. Business was as usual. But then, so quickly, the virus moved to make new homes: Italy, where things have completely gone out of control and Iran, where so little is known even today about the sheer extent of toll that this disease has extracted. Now the spread is practically universal; most of the world is in a lockdown mode. It is completely unbelievable.

As I write this, there are 415 coronavirus cases, with eight deaths in India. This pales into insignificance, when you consider that Italy has close to 60,000 cases; or that New York alone has over 16,000 confirmed cases. It is said that the cases in India do not represent the true numbers, because testing is limited. But this is where the real question arises. What should countries like India do, with limited testing facilities and even more limited public health infrastructures? All evidence now is pointing to the fact that as the pandemic reaches the community spread stage, the death count will increase because these countries cannot provide intensive care that is needed.

That's why the choice for Indians is stark—we cannot afford community transmission; we have to contain and to prevent further spread. Already, in my view, we have delayed the inevitable closure and not been strong enough on enforcing the rules of quarantine. And, yes, we have to increase our testing capacities, but it is also clear that we will never be able to test adequately once it spreads. So, testing has to be done to identify and isolate. But this is where we are weak. We have seen how people—the literate rich because they are foolish and the illiterate poor because they have no option—have been willfully breaking the self-shutdown.

There is no global leadership or institution that has the capacity to take us through a crisis crisscrossing national boundaries

Governments must explain this logic to us. We need to know that we have to shut down so that we do not end up spreading the virus, which we have seen in other countries where the virus has been galloping exponentially to infect entire populations within days. There is no rulebook on this virus, but what is clear is that the only way to contain it is to break the chain of transmission. This, of course, is tough as it brings economies to a grinding halt. It destroys livelihoods, particularly of the poor and the self-employed. Here too we will need governments to step in with social security and access to essentials so that people can cope and make their way through this never-before global catastrophe.

But this is not all. We need to use this time to think about some fundamentals—one of which is the issue of global cooperation. There is never a good time for such a pandemic to hit the world, but this is the worst time possible. There is no global leadership or institution, which has the respect and the sagacity to take us through, what is clearly a crisis beyond national boundaries. What we have seen in the past few months has been a shameful record of self-interest and self-preservation over everything else. For most of us who work to advocate for global cooperation on another existential threat like climate change, this should not be news. But it does shock you that even with such a crisis, which is literally bringing the most powerful countries to their knees, we are not getting together to discuss the global response to the global pandemic. Why? What more can and should we do? I want to discuss this further in the coming weeks.

Then, of course, there is the issue of public health—what coronavirus teaches us (if we care to learn) is that we are only as strong as our weakest link. If there is no access to public healthcare or if public health services have collapsed—as is the case in most of the emerging world (and the US) today—then we cannot withstand pandemics. It is also not enough to build this capacity within countries, because if any region of any country or any country of the world is weak, then the contagion will breed there and will spread. For how long will we be able to keep our borders closed? How will this even work?

And, this then, leads to my third question about the nature of globalisation post-corona. Will we learn from the vulnerabilities of our system to make it more robust—investing in local economies and local health systems through global partnerships? Let's keep discussing this in these tough times. DTE @sunitanar

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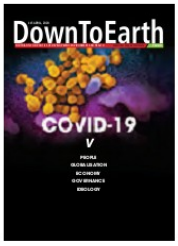
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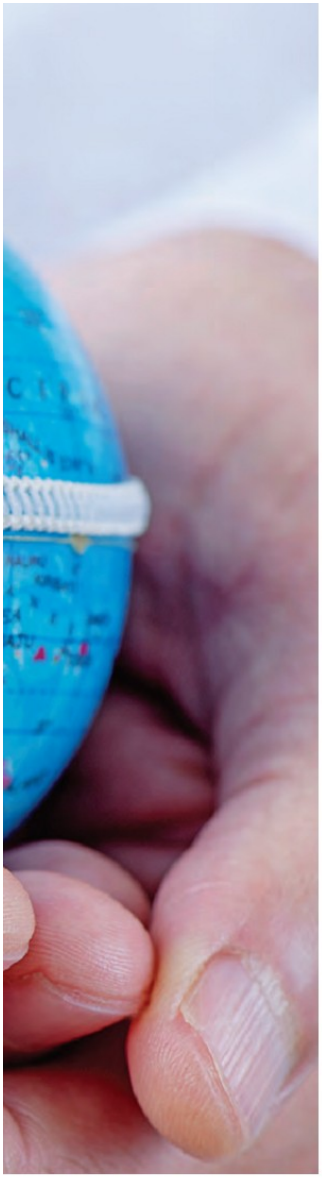
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Climate change won't wait for us to act

This is in reference to the editorial "Resource literacy of the poor" (1-15 March, 2020). While climate change will hit all equally, it is the poor who will suffer the most. We are told this at the end of nearly all commentaries on climate change impacts. We also know that the poorest people in our country live in or near forests. For instance, the tribal populations of central India. They depend the most on natural resources like forest and fresh water, which are now increasingly being usurped by urban and peri-urban India.

The failure of our forest management authorities to replenish or even sustain forest resources has led to degradation of our forests and water resources. Growing trees and conserving water inside forests, straightforward as it may sound, have become the most difficult thing to do. Why? Is it because the really poor and their livelihoods do not matter, or our unchanging management systems for forests and water just cannot cope, or politicians preoccupied with "other" agendas are oblivious to the climate change? Whatever be the case, it seems our representative parliamentary democracy is not working. Climate change will not wait for such a democracy to get its act together!

VINAY
VIA EMAIL



PHOTOGRAPH: VIKAS CHOUDHARY / CSE

Covid 19: Special Coverage

Down To Earth has been reporting the pandemic since its outbreak. Find all the latest updates, insightful articles and infographics on:
www.downtoearth.org.in/tag/coronavirus?sort=desc

FOR MORE ON CORONAVIRUS, SCAN

DTE TV

Human trials for Corona vaccine begin

Clinical trials for a vaccine against the novel coronavirus are on at the Kaiser Permanente Washington Health Research



Institute, Seattle, the US. The trials, involving 45 healthy volunteers aged 18-55 years, will be held over six weeks. The study will evaluate the experimental vaccine mRNA-1273 developed by US' National Institute of Allergy and Infectious Diseases and biotech firm Moderna Inc.

FOR MORE VIDEOS, SCAN

DATA CENTRE

Where are the doctors?

At India's community health centres, 77.5% of the positions for physicians were vacant, as of March 31, 2019. The figure for surgeons, gynaecologists and paediatricians stood at 79.9%, 64% and 69.7% respectively

Diesel gensets still rule

Fossil fuel-powered generators serve 20 to 30 million unique sites in developing countries and emit over 100 megatonnes of carbon dioxide every year. Developed countries are relatively free of the practice

FOR MORE INFOGRAPHICS, SCAN



Are we really depopulating?

The cover story "1.37 Billion and not counting" (1-15 February, 2020) provided the readers with thought-provoking material. The hypothesis of India getting depopulated looks far-fetched. Even if India is depopulating, its enormous population does need a very effective and tenacious population control mechanism.

The subject of population control has been handled thoughtlessly in the past. Neither coercive nor ad-hoc measures would give the results. We need to enforce incentive-based controls irrespective of caste, religion or region. But there should not be any disincentives because it would create controversies. Moreover, we should not compare ourselves with China which ranks above of us in population. China has the advantage of land; it has three times that of India's area. China also has the resources to feed and accommodate the double of its present population. India, on the other hand, is living on the edge. India is facing problems in sourcing land for developmental works, such as construction of highways, airports, dams, sewage treatment plants, among others.

L R SHARMA
SUNDERNAGAR

Study locusts at micro, macro levels

The article " Farm raiders" (1-15 February, 2020) was interesting and informative. Locust swarm attacks over India, particularly Gujarat and Rajasthan, are not new. As an agrometeorologist with the Indian Council for Agricultural Research, New Delhi, I participated in the surveillance and

monitoring of locusts in 1972-1973. During that period, there was a huge invasion of swarms in Rajasthan, Gujarat and to some extent in Punjab and Haryana. I recall, we formed a good surveillance team in the Indian Agricultural Research Institute consisting of scientists and experts from various disciplines to study day-to-day developments of the attacks and farmers' feedback. We also collaborated with the state agriculture departments of Rajasthan and Gujarat as well as with the India Meteorological Department to cull out the weather data for better analysis and interpretations. Locust attacks subsided 1974 onwards.



But suddenly we are once again experiencing its wrath! We need to monitor not only air temperature, but also, and more importantly, the soil temperature and the moisture status at shallow depths, say 10-20 cm, where locusts lay eggs and breed. Another significant meteorological factor contributing to the swarms' migration and journey is the upper air wind speed and trajectory, say the easterly jet streams, over the globe. The convergence and divergence of weather systems and cyclones/depressions in the atmosphere too play a role. It is better to study the abiotic factors at both micro and macro levels.

For better forecasting studies, we need to have an integrated approach involving experts and scientists from various fields like entomology, plant pathology, meteorology, economics and plant physiology. International cooperation with the World Meteorological Organization and the Food and Agriculture Organization can help tackle this global problem.

K K NATHAN
NEW DELHI

Just ban plastic manufacture

This is with reference to "Is implementation of plastic ban in various states confined to paper?" published online on February 19, 2020. A simple solution to the plastic menace is to ban plastic at the manufacturing stage. Many small eateries in Bengaluru use paper- or leaf-based packaging materials. Otherwise, they ask the customers to bring their own containers to carry the food items purchased.

BRAHMANYAN
VIA EMAIL

PHOTOGRAPH: RAJENDRA CHOUDHARY

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FACEBOOK

COVID-19: WHO criticises India's blanket travel ban

Posted on March 15, 2020

WHO needs to calm down, we know how they managed and messed up Ebola response in west Africa. In Sierra Leone, people did not want to work with them as they kept sitting without declaring it an emergency. So one should not believe everything WHO says all the time!

SUGANDH JUNEJA

I think India's move was right. Especially taking into account the density of population, the number of people traveling internally, how many might not report symptoms...

JAGANNATH CHATTERJEE

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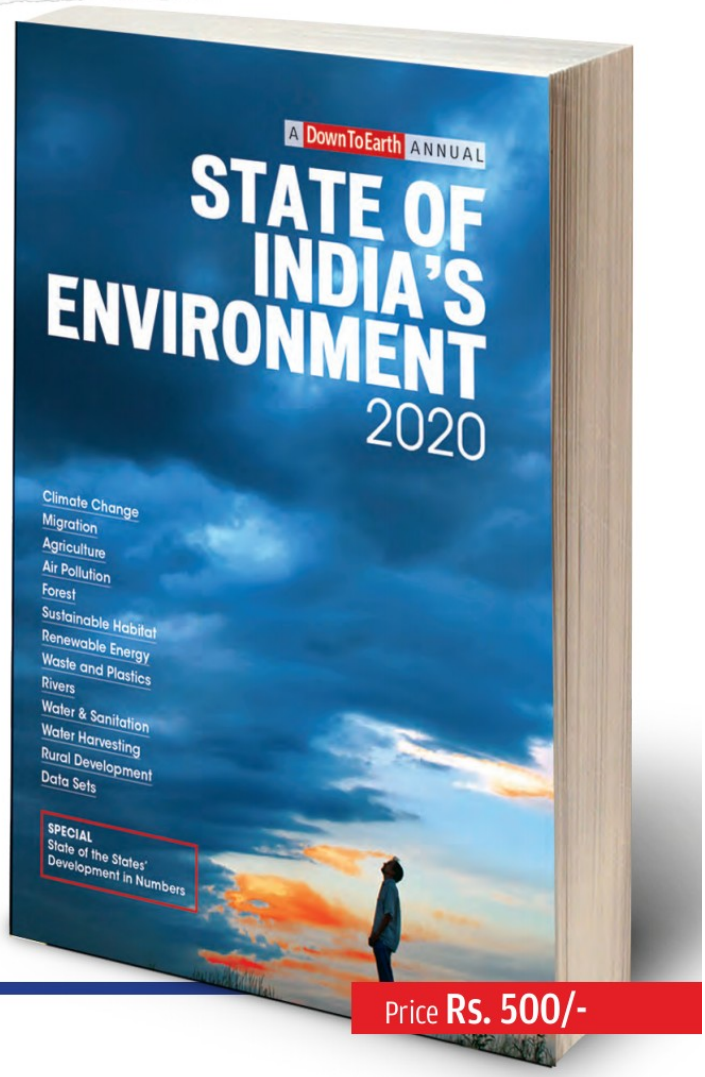
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Digest

WHAT'S INSIDE

Why Damodar Kashyap wants every tribal village in Bastar to own a thriving forest **P12**

16 African countries face hunger following repeated droughts, locust attacks **P14**

Democracy under siege in Guyana after oil starts flowing from its newly found reserve **P15**

1,000 WORDS VIKAS CHOUDHARY



In the wake of COVID-19 pandemic, the Delhi government has launched a drive to disinfect all buses, Metro trains, auto rickshaws and taxis on a regular basis. This is being done at the bus depots of the Delhi Transport Corporation. Mumbai has also put in place measures to cleanse its local trains.

FOR MORE PHOTOS, SCAN

Digest / IN FRONT

An old man and his baton

Damodar Kashyap has ensured food, and livelihood in Bastar villages by offering them thriving forests

BABA MAYARAM

IT'S NOT always that an individual's initiative finds place in academic curiculum. But the Chhattisgarh government has included the life saga of Damodar Kashyap in the social sciences syllabus of class 9. This septuagenarian belongs to the Bhatra community of Sandhkarmari, a village in the state's tribal-dominated Bastar region, where he has nurtured a sprawling forest over 240 hectares. Today, the forest ensures that people in the village are self-sufficient, have adequate groundwater and a robust community-led governance system.

"The forest was always there. It also had a sacred grove. But in the 1970s, when I returned from Jabdalpur after completing studies, all I could see was tree stumps. I started making people aware about the multitude of benefits a forest provides and encouraged them to plant trees. I particularly mobilised the ones who had felled trees," says Kashyap.

In 1976, communities elected him as the head of village panchayat. Immediately after this, he initiated a community-led system to regenerate the denuded patches of forests and to protect the village's intact forests. As part of this, he organised plantation drives from time to time. But to ensure community ownership over the campaign, he introduced the *thengapalli* system of protection. Under the system, forest protection is the responsibility of the entire village. Families take turns to patrol the forest from loggers. Every morning, they venture to the forest wielding the symbolic *thenga* (baton), with a flag attached to it. Upon their return in the evening, they would place the *thenga* in front of a household, which has to take the charge next day along with representatives of two neighbouring households. There is strict rule on how to use the forest produce. Residents can collect dry and dead branches to use in construction or as firewood. But anyone caught felling a tree is slapped with a fine of ₹500. Cattle grazing in the forest has also been restricted. Over time, *thengapalli* has become a symbolic activity only as the village no more reports illegal felling or violation of community rules on forest uses. Initially, 10 to 12 people were assigned the patrolling duty. Now only three stay on guard.



The village boasts of several kinds of trees, herbs and climbers. The major species include *sal*, *tendu*, *mahua*, *chironji* and mango. People in the village not only collect fruits and mushrooms from the forests for household consumption, they also sell to earn. Small wonder, for close to 35 years Kashyap has remained the unopposed head of the village panchayat.

His ability to conserve the forest and ensure sustainable livelihoods by deploying traditional knowledge and instilling community ownership has earned him several accolades. The message in that metaphorical baton is spreading to neighbouring villages, where communities depend on forests. Kashyap now advises them on how to regenerate a forest and insure livelihoods.

QUERY Digest

March gets increasingly wetter across India

JITENDRA



UNSEASONAL RAINFALL in March, accompanied by hailstorms and strong winds, have caused heavy damage to rabi crops across north India. While the Union agriculture ministry is yet to give any estimate of the damaged crops, major wheat and mustard producing states, such as Punjab, Haryana, Uttar Pradesh and Rajasthan, are worst hit.

According to the India Meteorological Organisation (IMD), between March 1 and 18, India received 82 per cent above normal rainfall; the figure was 212 per cent for central India. States where the maximum number of districts have been affected include Uttar Pradesh, Bihar, Madhya Pradesh, Punjab, Rajasthan, Gujarat, Chhattisgarh, Telangana and Haryana. Rabi crops were in the final stage of harvesting in these states. In Haryana, which received 650 per cent above normal rainfall for this period, farmers have reported crop damage over 95 per cent of farmlands.

Unusual rainfall events in March are becoming increasingly frequent in recent years. Winter rainfall is brought by the Western Disturbance (WD)—a non-monsoon precipitation pattern driven by the Westerlies or Anti-trade winds. They usually bring mild rain during January-February to the Indian sub-continent, which is beneficial to the rabi crop. But over the past decade, it has been shifting to March with increasing intensity. In 2015, rainfall in March was around 200 per cent more than normal. In March 2016, different parts of India reported unusually excess rainfall. Studies show thunderstorm days for the country between March 1 and June 30 have risen from 2015 to 2019; the incident of a thunderstorm in 2019 was highest in last five years.

There is no consensus among weather experts about this abnormal behaviour of WD, though some link it to heating of the Tibetan plateau and warming of the Arctic region in recent years.

'THIS YEAR UNSEASONAL MARCH RAINS HAVE HIT NEWER AREAS'

Mahesh Palawat, vice-president, meteorology and climate change at private forecasting agency Skymet Weather explains what the increasing frequency of rain in March means



How unusual is this year's March rainfall?
Usually, Western Disturbance (WD) that brings winter rainfall to India end by February. After that, it starts moving towards upper latitude and does not affect India. But this year, our observation shows, March is going to experience four to six WD events, continuing till the end of the month. We have already experienced two. The other two will arrive on March 24-25 and on March 30-31.

Do you think March is getting wetter in recent years?
No. Rainfall in March has been observed more or less every year. It was experienced consecutively in 2014, 2015 and 2016. But the intensity this year is quite high. What's also unusual this year is that the intense rainfall and thunderstorm extended till eastern and central India. These regions had not experienced rainfall in March in the recent past. It even spread to southern states like Telangana and Andhra Pradesh. We expect such intense thunderstorm activities only during the pre-monsoon months of April and June.

What could be the reason for this?
It is a fact that extreme weather events are on the rise. This year, the weather anomalies are occurring even in the absence an El Niño condition, which is neutral till now. This clearly indicates that our seasonal weather is getting disturbed due to climate change.

Digest / COVERAGE

Hunger looms over southern, eastern Africa



ABOUT 16 countries in Africa are staring at the worst food insecurity in decades as drought continues to grip the region for third consecutive year and swarms of desert locusts have taken over farms. These countries include Somalia, Haiti, South Sudan, Sudan, Ethiopia, Nigeria, Burkina Faso, Chad, Mali, Niger, Congo and Burundi.

The rainy season across southern Africa in 2018-19 was one of the driest on record in past 40 years. In Zimbabwe, the government is struggling to provide water and food to about 8 million people comprising about half of the country's population. The country's southern and north-western regions are the worst hit. In the backdrop of foreign currency deficits and plummeting value of the Zimbabwean currency, the country is also struggling to access grains from the international market. To tide over the crisis, the government has recently lifted its ban on genetically modified corn.

In Namibia, about 350,000 people are threatened by hunger. Most areas are suffering from water shortages as reserves remain dry. The government says the country faces a famine-like situation and has sought intervention of the World Food Programme (wfp). In Madagascar, the Food and Agriculture Organization (fao) warns that food reserves are almost exhausted and some half a million people are in a nutritional crisis.

Countries in eastern Africa, on the other hand, received exceptionally heavy precipitation—highest in the past 40 years—during last rainy season. But the unusually wet conditions turned the environment conducive for the severe outbreak of desert locusts, causing an "unprecedented threat to food security and livelihood" in at least nine countries, says fao. Kenya suffered its worst locust infestation in 70 years.

As fao warns that the number of locusts in east Africa could increase 500 times by June, the fight against locusts has been hit by a shortage of pesticides following the suspension of flights worldwide in the wake of covid-19 pandemic.

EXTREME

13.07%

This is the rate at which pesticide consumption has increased across the country between 2014-15 and 2018-19, says non-profit Pesticide Action Network

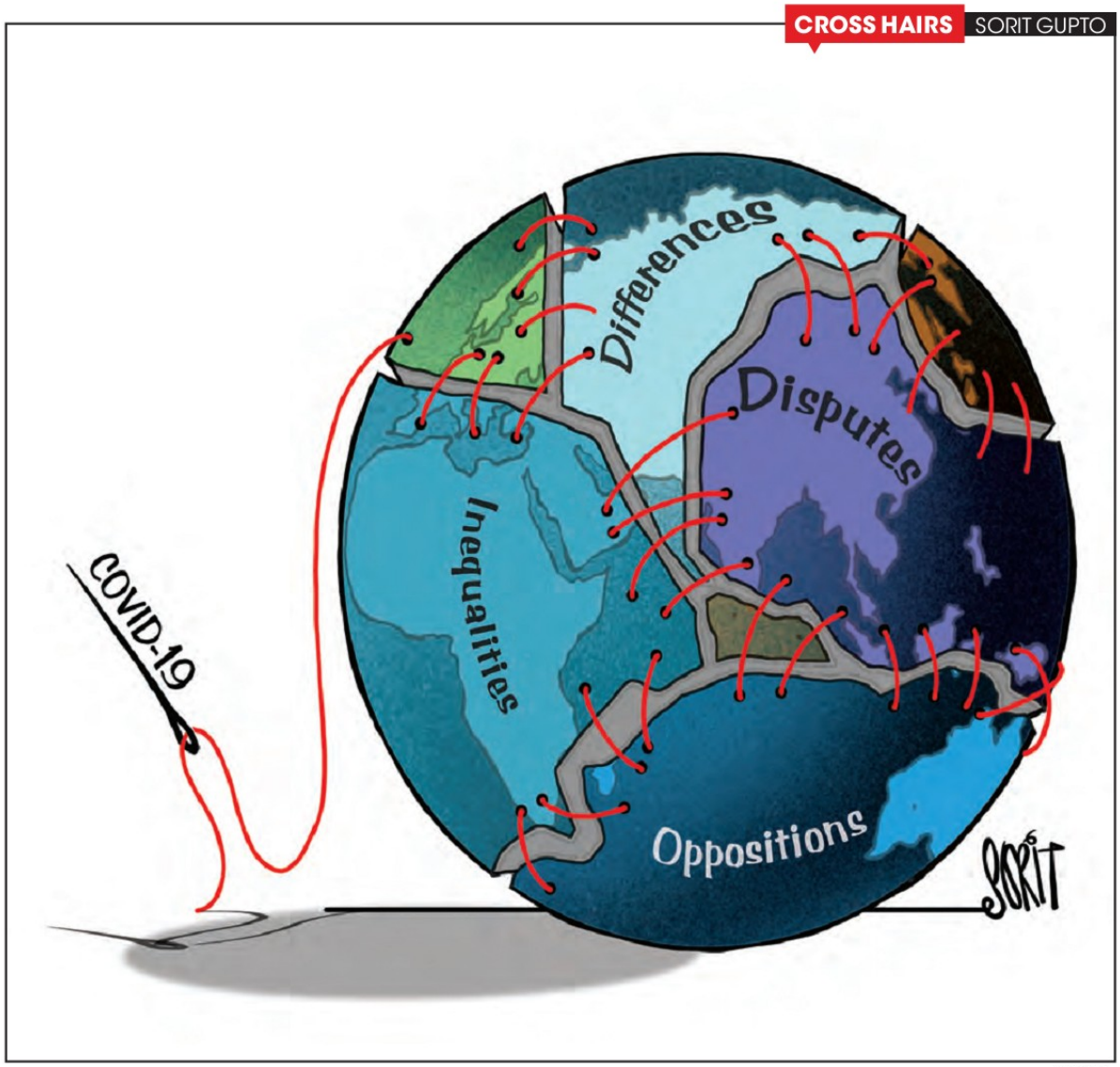
27% is the rise in the number of active ingredients registered for use since 2011

35.6% is the increase in pesticide consumption by Maharashtra. It consumed the most chemical pesticides in the past five years at 61,138 tonnes

14.7% is the increase in pesticide consumption by Uttar Pradesh, which has consumed 52,747 tonnes of chemical pesticides in the past five years. It was followed by Punjab, which consumed 29,394 tonnes of chemical pesticides.

10% of the total pesticides used in the country was biopesticides, considered a safer alternative to chemical pesticides. Insecticide and weedicide production increased in 2015-16, while fungicide and rodenticide production declined.

CROSS HAIRS SORIT GUPTO



FOR MORE CARTOONS, SCAN

Guyana slips on newly found oil

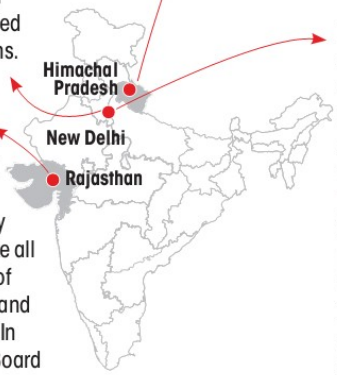
THE TINY Latin American country and its 80,000 population are on the cusp of a transition. The recent discovery of 8 billion barrels of oil off its coast by a consortium led by Big Oil ExxonMobil has put the continent's third-poorest country among the world's top 20 oil producing countries. But this has also put its democracy in danger.

The country went to polls just a couple of months after oil started flowing from the blocks. Following high-pitched campaigns, election ended on March 2. But even before the official result was out, both the governing coalition, which has been in power since 2015 and is led by President David Granger, and the opposition People's Progressive Party (PPP), which led Guyana for 23 years until 2015, have claimed victory. A recent attempt by world leaders, including the US government, and groups including the Organization of American States, to end the impasse by calling for a recount of votes has also failed, after the country's high court issued a temporary injunction blocking the recount. PPP in the meanwhile has filed charges against the country's Election Commission, accusing it of vote rigging.

Digest / SNAPSHOTS

Responding to an order by the National Green Tribunal (NGT) for assessing the impact of brick kilns on top soil and ambient air, and their performance while operating on agro-residues, the Central Pollution Control Board has said the ones using agro-residues are based only around Delhi. At least four months are needed monitoring the 65 brick kilns.

NGT has pulled up the municipal authorities of Shimla for not taking action against a six-storey building constructed in Ghanahatti area. No building exceeding three storeys can be constructed in the area with steep slopes.



Responding to an NGT order, Delhi Pollution Control Committee (DPCC) has closed 90 steel pickling units at various industrial areas. DPCC has also asked the operators to remove plant and machinery used by them to ensure that there is no chance of revival of the activity in industrial areas of Delhi. These units were allegedly discharging their untreated acidic wastewater into sewers, stormwater drains and on roads.

The Supreme Court (SC) has directed the Ministry of Environment, Forest and Climate Change to send a team comprising veterinary doctors to examine and take all steps to restore the health of the elephants at Amer Fort and Haathi Gaon in Rajasthan. In 2018, the Animal Welfare Board of India had revealed cruelty to elephants used for rides in Jaipur. All the four elephants who died in 2017 were suffering from TB-like illnesses, said the report.

So far...

Number of cases on environment and development tracked from January 1, 2020 to March 13, 2020

Supreme Court	High Courts	National Green Tribunal
12	10	139

Compiled by DTE-CSE Data Centre

FOR DETAILED VERDICTS, SCAN

Karnataka gets Mahadayi water

THE SUPREME Court (SC) in its interim order has allowed the plea of Karnataka government for implementation of the award by a tribunal for sharing of the Mahadayi river water between Goa, Karnataka and Maharashtra. The tribunal in August 2018 had ordered allocating 13.42 tmc (thousand million cubic feet) of water from the river basin to Karnataka. The state is already building barrages across Kalasa and Banduri, the tributaries of the Mahadayi for diverting the water for its cities. While SC has said the final hearing will take place in July, Goa plans to file an application in the apex court, pleading that Karnataka not be allowed to go ahead with construction on the Kalasa-Banduri project.

BITS

IN 2014, when the first case of Ebola was identified in Nigeria, it successfully managed the outbreak by demonstrating aggressive and coordinated response. But COVID-19 is different. Despite the steady rise in coronavirus cases in the country, doctors in the capital Abuja have gone on strike, demanding two months' back pay.

AS RESEARCHERS gather evidence that sea turtles are becoming ill or stranding on the beach due to ingestion of plastic debris



dumped in the ocean, a recent study explains why they could be consuming plastic in the first place. The study, published in journal *Current Biology* shows that just after seven days in the ocean, plastic particles become so coated with algae and other microorganisms that they start smelling like food.

MATERIAL ENGINEERS at the Purdue University, US, have developed a device that uses sound waves to detect the stiffness of an extracellular matrix, a structural network that contains cells, loaded onto the platform. Disease specialists can use the device to study the progression of diseases like cancer and ascertain whether it is invading other tissues, says a study published in *Lab on a Chip*.

Himalaya SINCE 1930





Healthy India, Happy India



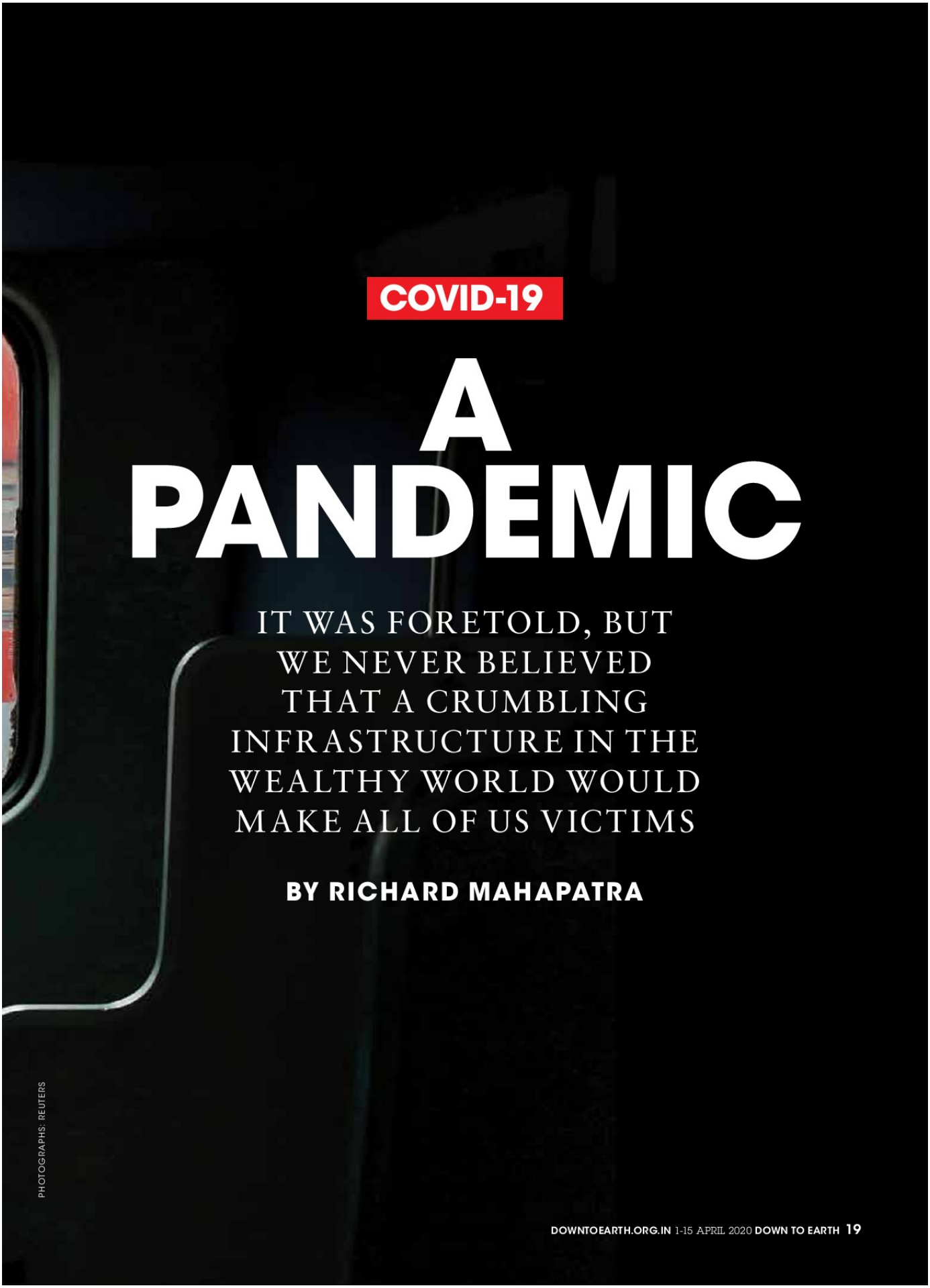
Spreading Happiness and Wellness!

Over the years, Himalaya has actively promoted the health and well-being of individuals across all age groups. Our campaign 'Healthy India, Happy India' focuses on health-care by conducting comprehensive health camps in rural, semi-urban, and remote areas.

Our recent camp in Mawphlang village, East Khasi Hills, in association with SYNJUK (Ka Synjuk Ki Hima Arliang Wah Umiam Mawphlang Welfare Society), gave the local community access to specialized healthcare services, such as Dental, Ophthalmology, Gynecology, Pediatrics, Ortho pedics, and General screening. Awareness sessions were conducted on health and hygiene, and free medicines were distributed during the camp. Through this initiative, we reached out to over 1000 individuals.

Similar camps have also been conducted in Rajasthan and in more than 378 schools in Bengaluru.





COVID-19

A PANDEMIC

IT WAS FORETOLD, BUT WE NEVER BELIEVED THAT A CRUMBLING INFRASTRUCTURE IN THE WEALTHY WORLD WOULD MAKE ALL OF US VICTIMS

BY RICHARD MAHAPATRA

PHOTOGRAPHS: REUTERS



THE PLANET is locked in containment. Barring lifestyle diseases, no other disease or infection has ever caught the grip of the globe in contemporary time—176 countries, and over 2,00,000 patients spread in every continent, except the Antarctica. Rich or poor, some 3 billion people are virtually in containment as 112 countries have closed their borders (see map, *p* 22). We are in the midst of what is called the containment stage in the global protocol to fight a pandemic.

But the invisible foe—COVID-19—has already escaped from our radar. It is spreading faster than anyone had expected. Between the period *Down To Earth* did its last cover story on coronavirus in February, and now writing this unprecedented second cover closing on March 20, cases outside China–the origin of the pandemic–have increased by 15-fold (see graph: "Tipping point"). Our helplessness to control this first non-flu pandemic of the 21st century has resulted in panic and hysteria. Health experts are no more hopeful of containment because we still don't know the real number of cases from poor and developing countries that are ill-equipped to screen and count such cases.

We still don't know how and when it transferred into a human host from an animal. But we know for sure now that it is a prolific jumper from human to human. Taking a clue from the Spanish Flu pandemic of 1918, we, the social animals, have been prescribed with social distancing—measurable to 3 feet—as the best way forward to delay transmission of COVID-19, not to stop it.

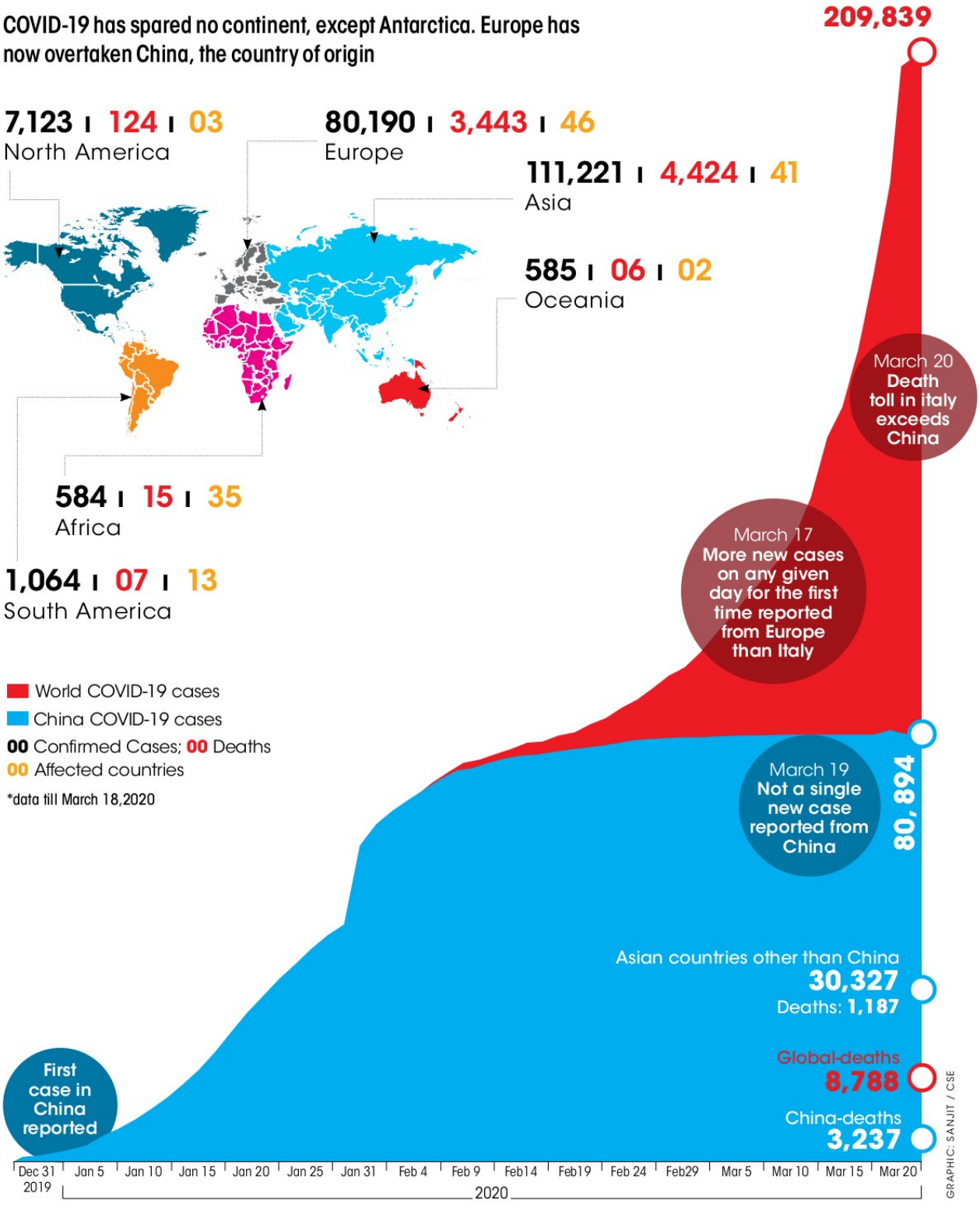
Coronavirus is not new to us, but COVID-19 is. It is the third new human coronavirus of the century. And its characteristics are not in line with this family of virus. Coronaviruses were supposed to have evolved in humans just to widen their spread, thus, not to kill but just to sicken us. But that is not happening. COVID-19 has already killed more than the earlier two such infections together—SARS and MERS. When it infects also, the symptoms are not according to observed patterns. They are mild enough not to be noticed and in many cases even absent after being diagnosed.

That is where the spread is unbridled: we don't treat or contain those who don't show symptoms. After the outbreak in China, the immediate screening and detection elsewhere were not adequate. In Africa, Chinese workers were allowed immediately after the New Year holiday, and they were not screened. This also makes all of us a potential carrier of the pandemic, and making it simply not containable. Marc Lipsitch, a professor of epidemiology with Harvard University, USA, says, "I think the likely outcome is that it will ultimately not be containable." After China's quarantining 100 million people in and around the epicentre, Wuhan, COVID-19 spread to rest of the world much faster. On March 6, we had 100,000 cases which doubled by March 18.

As screening and detection became aggressive across the world, new epicentres or secondary hotspots emerged in hydra-like splits, from Europe, West Asia and Southeast Asia, and now to Africa. This means the world has to mount an even bigger and more expansive containment and surveillance to catch each suspect and then scan all those who were in touch with this individual. The virus has emerged as the powerful demolisher of the globalised world, where we all thought the world is with us for everything. One after another, COVID-19 tested the crumbling health infrastructure in

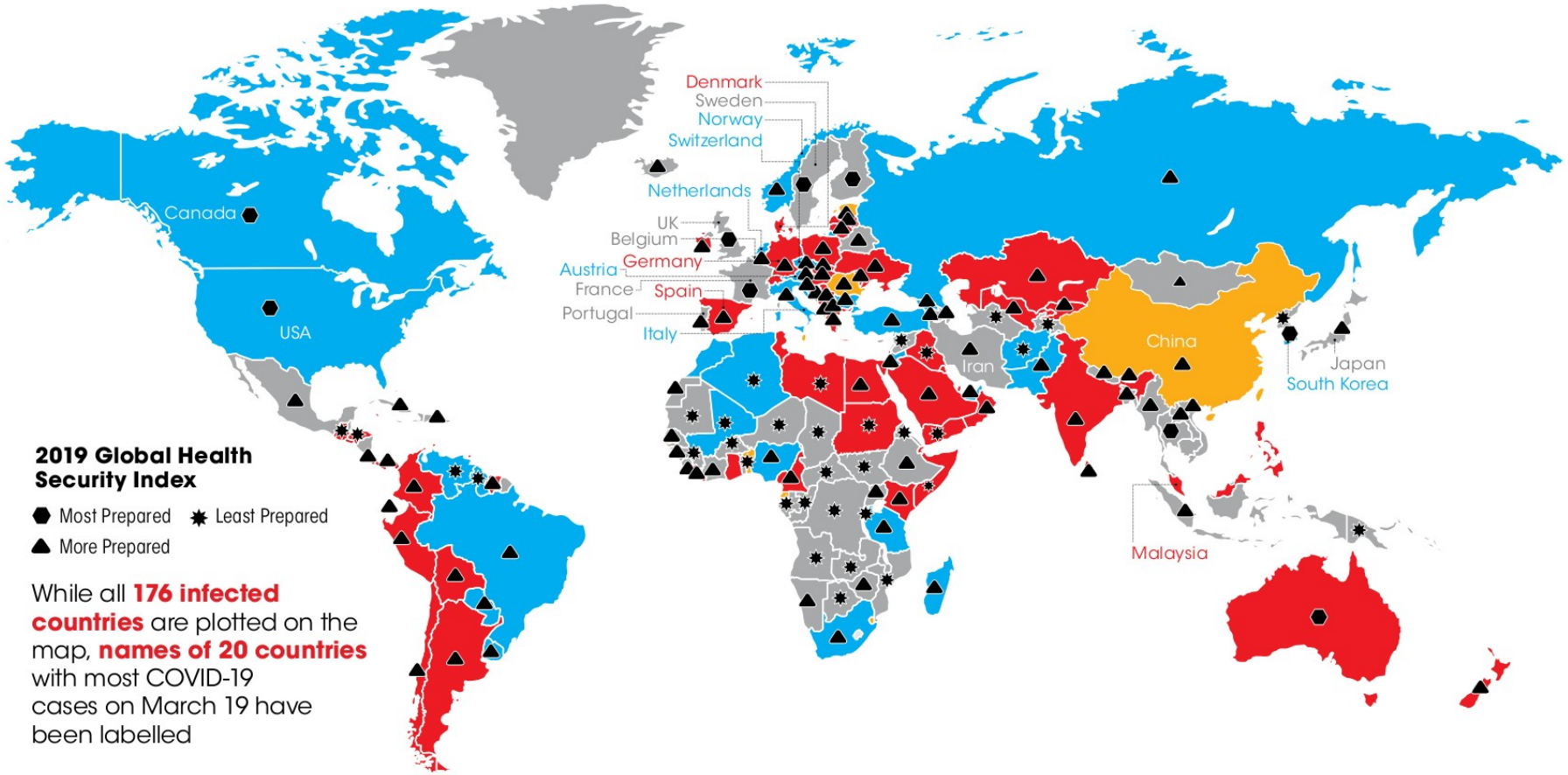
TIPPING POINT

COVID-19 has spared no continent, except Antarctica. Europe has now overtaken China, the country of origin



UNPLUGGED BY A VIRUS

With 112 countries forced to close borders, COVID-19 shows that no country in the world is prepared for epidemics or pandemics



2019 Global Health Security Index

- Most Prepared
- Least Prepared
- More Prepared

While all **176 infected countries** are plotted on the map, **names of 20 countries** with most COVID-19 cases on March 19 have been labelled

Border shutdown*

59 Countries | **2,482 million** Population at risk

Countries that have completely sealed their borders, shutting down road, sea and air routes

Border restrictions*

53 Countries | **2,343 million** Population at risk

Countries that have shut down road, sea and air routes to neighbouring and/or high-risk countries

Domestic lockdown

53 Countries | **822 million** Population at risk

Countries that have only taken domestic steps. From widespread testing to social isolation, all the 176 infected countries have taken some domestic measures

Quarantine for new travellers

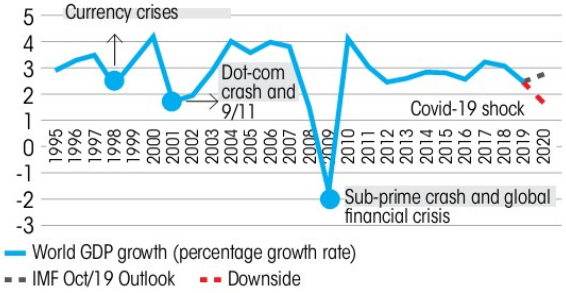
11 Countries | **1,490 million** Population at risk

Countries that have made 14-day quarantine mandatory for all entering the country

*Except for citizens or residents returning home or special circumstances; Source: Local governments/media reports and Global Health Security Index 2019; Updated till March 19, 2020

Hefty price

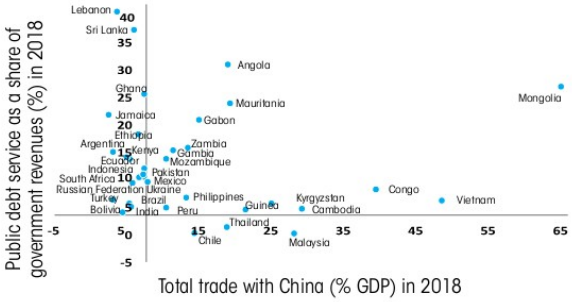
The Covid-19 shock will decelerate global annual growth to below 2.5 per cent—the threshold for recession. This will cost the world US$ 3 trillion in 2020



Source: UNCTAD

Developing thoughts

All 177 developing countries will be badly hit by COVID-19 due to rising public debt and high dependency on China



Source: UNCTAD Secretariat calculations, IMF Global Debt database and COMTRADE. The graph is centered with average values for all developing countries.

the developed world. Their weaknesses and failures got globalised as affected people took the virus to other countries. Developing countries are dense in settlement and population. This makes containment and detection less effective. Thus allows transmission in multiple chains, almost like an uncontrolled atomic chain reaction. With over 8,788 deaths by March 20, the fear of fatality leaping seems real now. T Jacob John, a paediatrician who has extensive experience of more than 25 years in microbiology and virology, says, "As much as 60 per cent of the Indian population would be infected in a year's time because the infection would be seeded well. The reason why I put such a number is the fact that unlike mosquito or waterborne infections, this is a respiratory infection."

The world is now unable to contain the spread and hopes that it becomes a general community infection, like any other cold and flu. It is argued that in such a scenario the community would develop immunity and thus developing the capacity to fight. But, it also means that the fatality from COVID-19 would be in thousands till we reach this level of infection. "What is important is the timescale: whether it is in a matter of 6-9 months which will completely overwhelm many health systems, or over many years which will allow health systems to cope adequately," says TEO Yik-Ying, dean, Saw Swee Hock School of Public Health, National University of Singapore. In Italy and Spain we are already witnessing this situation, while it is going to erupt in India and African countries. As the virus spreads, the already-stressed health infrastructure will be under extra pressure. This would be overwhelming and fatalities would be more.

There is almost an acceptance that the world goes through seasons of flu and cold, most of them are infections that erupted as epidemics in different points of time but gradually became seasonal. Are we going to experience the same? If we believe epidemiologists, we would have soon a regular COVID-19 season, and we will have to pay heavily in terms of human costs.

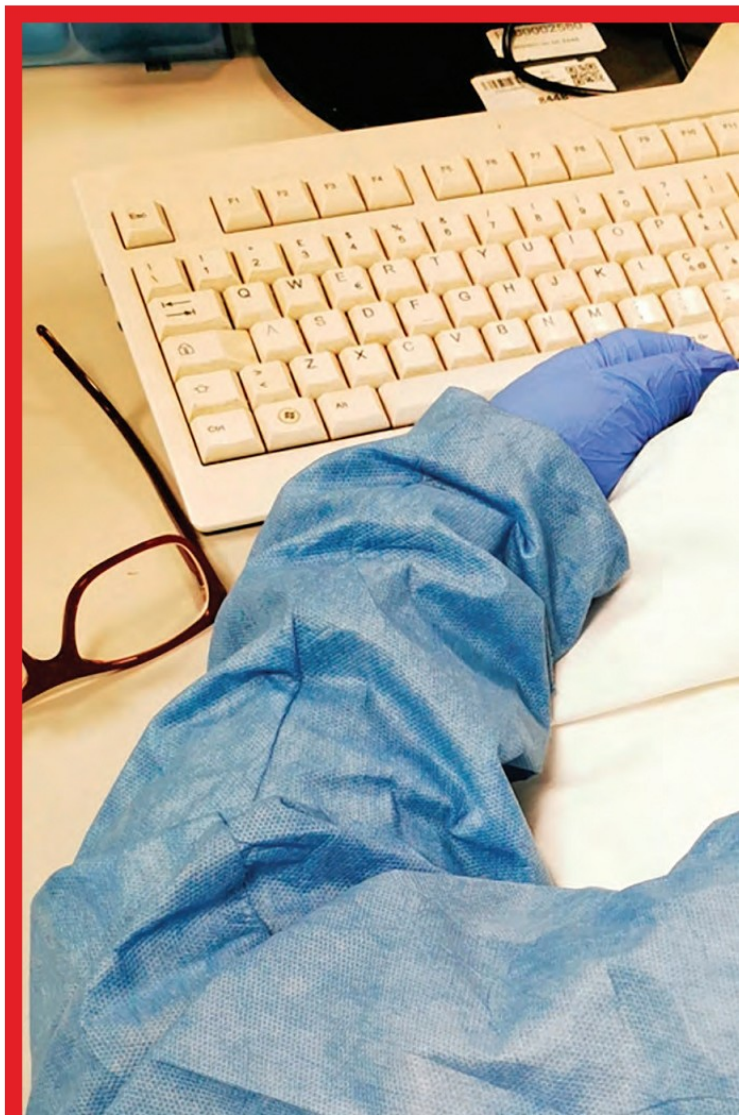
THIS IS WHY

Globalisation is punishing everybody for somebody else's unpreparedness. The COVID-19 pandemic has exposed how fragile we are in the face of a globalised health emergency

CHRISTOPHE HITAYEZU AND **BANJOT KAUR**

IT IS the globalised world's most localised emergency. An epidemic has become a pandemic faster in a globalised world, as we have experienced now. The outbreak of the new strain of coronavirus took just 70 days to be declared as a pandemic on March 11. But the effort to contain it has to be ultra-local. It boils down to a physical distance of over 3 feet between two individuals just to stop it from spreading further. How a local health infrastructure mounts surveillance and testing in its neighbourhoods makes the difference as to how deadly this globalised scourge becomes. It is almost an intense personal fight to stop a fast globalising invisible virus.

In Italy, the health system was overwhelmed—considered the second best in Europe—and reported more fatalities than China. Here, doctors applied judgement as to which patient they should to treat and which ones they should leave to die. Most COVID-19 patients were old, and needed intensive care. But there was no adequate health infrastructure or facilities. The country banned funerals to avoid gatherings, so military transport was arranged to ferry dead bodies. The whole country is under isolation at present. In the US, it is an emergency like never before. Its healthcare system has not been able to manage the



deluge of patients—by March 20, 150 people had died. Though the Congress has passed the Families First Coronavirus Response Act to bear the testing costs for COVID-19, the treatment is turning out to be prohibitively expensive—27 million Americans are without health insurance and an average treatment costs around $35,000 per patient (based on cases reported). The Kaiser Family Foundation has estimated that even with insurance and in case of non-complicated cases, the treatment would cost around $9,763. With over 10,000 patients already under treatment, the country is proposing to adopt direct cash support to its affected citizens. This flags a caution as the march of COVID-19 moves to developing countries such as India and Africa. How would a lesser-developed healthcare systems in these countries react to the pandemic?

With over 200 cases of COVID-19 infections, India is staring at an eruption of cases as screening and detection efforts have picked up. The Indian Council of Medical Research says by mid-March, India was in the stage second of the pandemic: dealing with infection from people who travelled to countries with COVID-19 cases. The country is checking out and quarantining those who came in contact with the infected. But transmission is believed to have become domestic and untraceable waiting to

A nurse rests during a night shift at a hospital in Cremona, Italy



show up in big numbers in a few weeks, to be specific by mid-April. This is inevitable, but the ongoing efforts to contain the infection can delay it. India has already imposed a travel ban for foreigners. Some 15 states have enforced closure of public gatherings. Five Northeast states have sealed their borders.

THE NEW HOTSPOTS

The focus on India as the next big geography of spread is valid given its 1.37 billion population and its dense distribution. There is a fear whether India's weak health infrastructure would be able to manage a pandemic of this proportion. According to the United Nations Conference on Trade and Development, India is one of the 15 economies to be most impacted economically by pandemics. Given that tourism, services and other retail sectors will be affected the most due to restrictions on mobility, some 30 per cent of India's workforce is staring at economic losses. This, in turn, will weaken people's capacity to bear their health expenditure (see "Last Word", *p*58).

Like India, Africa is also a secondary hotspot. The continent has over a billion population and underdeveloped health infrastructure. Till first week of March, the Johns Hopkins University's real-time interactive map on COVID-19 didn't show those scary red dots indicating infections in sub-Saharan Africa. But by March 10, the situation changed. In just 10 days, 33 African countries reported more than 600 cases and 17 deaths due to COVID-19. Just



A man, wearing a protective mask, places a poster on the door of a closed shop due to the coronavirus outbreak in central Madrid, Spain
v

like in India, experts say, in Africa too, the virus is spreading across the continent undetected and even faster. "My concern is that we are sitting on a ticking time bomb," says Bruce Bassett, a data scientist at the University of Cape Town, who has been tracking COVID-19 data since January. The response is showing up slowly.

Around 30 African countries have imposed travel restrictions from China and other countries with positive COVID-19 cases. For example, in Uganda, travellers from 16 countries must be quarantined at their own cost for 14 days. Angola has temporally banned direct travel from seven countries. China is Africa's main trading partner. This has increased air traffic between China and Africa, says John Nkengasong, director of the African Centres for Disease Control. Mary Stephen, a public health expert at the World Health Organization (WHO) Africa Region, says they have assessed pillars of preparedness and response for Africa, and one of the pillars is their capacity of case management and availability of facilities.

Way back in August 2019, Africa's preparedness for a pandemic came into focus. WHO had asked African countries to make "pandemic preparedness" more affordable for people on the continent in a new strategy document. Pandemic preparedness in Africa is estimated to cost $2.5-3.5 per person annually, according to the Regional Strategy for Integrated Disease Surveillance And Response (IDSR strategy), prepared by WHO.

Pandemics can be very disruptive. Even a moderately severe pandemic could have a potential global economic impact of $500 billion, or 0.6 per cent of global income. In contrast, the cost of adequately preparing for a global pandemic is estimated at $4.5 billion, or less than $1 per person per year. Unfortunately, according to WHO, most countries are grossly underprepared in infrastructure to mitigate a pandemic crisis. This indicates that the pandemic preparedness per person per year in Africa is expensive, rather than affordable. That's why, investing in pandemic preparedness is an affordable public health good for Africa, said the IDSR strategy document. Charles Bigabiro, an expert in health economics, says, "Most of the countries are not ready, authorities are not yet aware of the pandemic and don't have commitment to protect their population. They think the problem is for other countries."

Assessing the facilities, WHO's Mary Stephen says countries are now using facilities for other infectious diseases to manage COVID-19 cases. "Despite the fragility of the health system, countries have surveillance in place that is enabling health workers to detect the infected. If you look at some of the statistics that are coming out from China, we understand that 81 per cent of the cases are mild, 14 per cent are severe and 5 per cent of the cases are critical. So 19 per cent of the cases would require hospitalisation," she says. "In the past, Africa has dealt with more than one epidemics like cholera, Ebola... so that the continent has great resistance and coping capacity," says

AFTERSHOCKS#COVID-19

Rush for drugs development

There are over 300 clinical trials underway to find a cure for COVID-19. One such drug is remdesivir, developed and patented 10 years back by Gilead Sciences. It is being tested against a variety of pathogens including the Ebola virus. A recent study showed that this drug was useful against MERS coronavirus, suggesting that it could work on COVID-19 too. Generic versions of this drug have been developed by BrightGene Bio-Medical Technology in China. Meanwhile, researchers at Moderna, a Massachusetts-based biotech, have developed an mRNA vaccine which is set to be tested on 45 healthy people at Kaiser Permanente Washington Health Research Institute. The future of these drugs and vaccines depend on how the disease pans out. In case people develop immunity against the pathogen naturally, the vaccine might not get a market. A pertinent question haunts: whether these drugs and vaccine, if found effective, would be accessible to the poor?



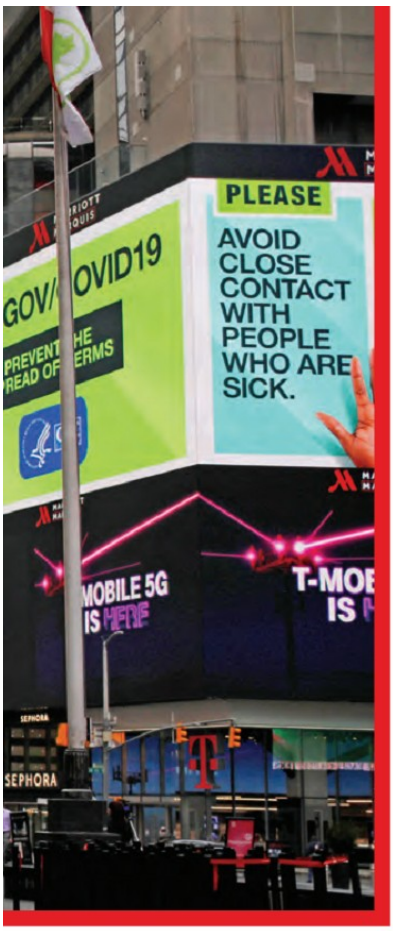
AFTERSHOCKS#COVID-19

A trillion dollar loss

COVID-19 will usher in a global recession and the world will lose over US $1 trillion, estimates UNCTAD. The World Health Organization has requested member countries to provide US$675 million for strategic preparedness and response plan for the pandemic. Of this, $61.5 million is needed urgently to mount various activities till April. So far, WHO has received $153 million. But as COVID-19 spreads, it will add on to the budget requirement, particularly for low-income countries. The World Bank Group has announced an initial package of $12 billion to assist countries in coping with the health and economic impacts of the pandemic. Many countries have already parked funds for fighting the spread in their respective countries. The US has declared a $1 trillion stimulus package to hedge the economy from slipping into a deep recession. The Canadian government is providing $82-billion aid package to its citizens and businesses through income supports, wage subsidies and tax deferrals. India has pledged $10 million toward a COVID-19 emergency fund for the South Asian Association for Regional Cooperation nations.

Michael J Ryan, executive director of WHO's Health Emergencies Programme.

However, experts have expressed concerns about the late onset of the outbreak in Africa. This is mostly based on the contested hypothesis of COVID-19 thriving in colder temperatures and becoming milder in a hotter atmosphere. Going by the temperature in countries affected, it is clear that the most affected are colder than those least affected. Severely affected countries like South Korea, Italy, Iran and Spain had temperature ranging from 6-12^0 C during January-March. In sub-Saharan Africa, countries reporting COVID-19 like South Africa, Nigeria, Senegal, Togo, Cameroon and Benin had 20-32^0 C in this same period. For example, the peak circulation of flu in South Africa is in the winter season between April and July. But there is a catch. "In Senegal, the peak season is in the rainy season, from July to October. Many other African countries experience these peaks during the cold rainy season.



A message about protecting yourself from the coronavirus is seen on an electronic billboard in a nearly empty Times Square in Manhattan in New York City, USA

This could mean that the preparedness of most African countries may soon be tested when these seasons come, especially as many more countries are confirming imported cases into the continent," says Akebe Luther King Abia, research scientist, University of KwaZulu-Natal in Durban. There is no let-up in this scourge.

GLOBALISED VIRUS

"We have not seen a global epidemic like this in 100 years. Nobody has an experience of having dealt with anything like this in the past," renowned historian-philosopher Yuval Harari said in a news show on CNN. He links it to recession, and the globalised nature of our existence. Either globalisation will have a multiplier effect on this pandemic or those favouring globalisation say pandemic would rather negatively impact globalisation. Differences apart, they agree on one point: globalisation is going to be a deciding factor in this pandemic. What the world was busy

TURN TO P32 ▸▸

Curves that matter

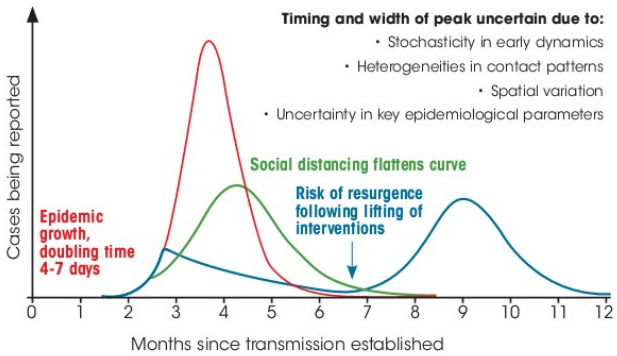
Projected paths of the pandemic

Snigdha Das

Exponential curve This offers the worst case scenario, where the virus spreads uncontrollably. Since the word "exponent" is grounded in algebra, the curve suggests a rapid increase of the infected, as is typical of exponential growth. Let's take a conservative estimate. If a sick person infects two others in a day, there will be 16,000 cases after 14 days. The infection rate, though varies from country to country, is higher for COVID-19, suggesting a steeper infection curve. During this rapid infection growth phase, the number of people needing hospitalisation can grow in leaps and bounds, overwhelming the local healthcare system. More hospitals may run out of basic supplies they need to respond to the outbreak.

Flatten the curve Since there is no vaccine to medicine to treat COVID-19 and only limited testing kits to diagnose the virus, flattening the curve is the only effective intervention to limit the spread of the virus. The infection rate can be reduced through a combination of collective actions, such as social distancing of the entire population, case isolation, household quarantine and school and university closure. Though the same number of people may get infected in a flatter-curve scenario as in the exponential-curve scenario, a slower infection rate ensures a less stressed healthcare system, fewer hospital visits on any given day and fewer sick people being turned away.

Sine curve This is the basic example of a periodic curve, a graph that keeps repeating. Flattening the curve can help reduce the rate of transmission. But there will still be the risk of resurgence once interventions are relaxed. Interventions like social distancing may thus need to be in place until a vaccine is developed—after 18 months or longer.



Source: *How will country-based mitigation measures influence the course of the COVID-19 epidemic?*, published in *The Lancet* on March 9, 2020

"PANDEMICS ARE THE SPILLOVERS OF GLOBALISATION"

Ian Goldin is an economist and professor of globalisation and development at the University of Oxford. He forecasted a pandemic similar to the current one in his book *The Butterfly Defect: How Globalization Creates Systemic Risk, and What to Do about It.* He spoke to **Vibha Varshney**



DOES THIS PANDEMIC SUGGEST THAT WE MUST RETHINK GLOBALISATION?

I have felt the need to rethink globalisation for very long now. We know globalisation is very good as it lifts people out of poverty, creates opportunities, spreads vaccines and medicines, jobs and finance. That is one of the reasons India like many other developing countries have seen rapid progress. It is sharing of ideas, technologies, skills, good and services, finance with other countries which defines the beneficial part of globalisation.

But it also very dangerous and can be very ugly. I always think globalisation as the good, the bad and the ugly. In order to harvest the benefits, one has to manage the risks. But what we are seeing is that people are not managing the risks, and this is

making globalisation dangerous. Dangers like pandemics are the spillovers of globalisation. Integration of China with the world economy, 1.4 billion tourists, business travelers around the world every year are not only spreading good things, but also spreading bad things. Take the case of pandemics like that of the COVID-19. The rapid growth of cities like Mumbai and Wuhan which have airports means that anything that happens in these cities can go across the world in just a few days. And this is what we are seeing in this pandemic. This spread is not only in pandemics, we saw this spread in the financial crisis in 2008 too, cyber viruses which are spread around the world are another example, and there are also existential unintended consequences of rapid growth coming from globalisation, like climate change.

The answer is not de-globalisation. The answer is not to build high walls. There is no wall high enough even for mighty countries like India, China and the US to keep out the great threats in the future. These are the threats such as climate change, pandemics and financial crises. These high walls keep out ideas, technologies, vaccines and finance.



What is missing from globalisation is political globalisation and human globalisation. We need to recognise that the world is as strong as its weakest links. We have countries turning their backs on the United Nations. This is not fit for the 21st century. Global agencies are doing their best, but their shareholders, the governments, are not reforming and empowering them. That is the challenge.

WHAT IS MORE LIKELY TO HAPPEN? GLOBALISATION OR DE-GLOBALISATION?

It depends on how you define globalisation and what you are talking about. If you are talking about Asia, my sense is that we would continue to see a rapid growth of Asian economies like India, China and Indonesia. They will also recover when the pandemic is over.

We will see growth in other places too, but at a slower pace. We are not entering de-globalisation, and but only entering globalisation of a different nature. We are more likely to see less of manufacturing trade, but more services trade. Asian countries recognise that they need the benefits of globalisation, which I don't see being reversed. If these are being reversed, it would be detrimental. Of course, we also need policies to manage the risks of globalisation.

HOW CAN WE ENSURE INFECTIOUS AND ZOONOTIC DISEASES PREVALENT IN ASIAN COUNTRIES DO NOT CAUSE PANDEMICS IN FUTURE?

To control pandemics, countries need the capacity to monitor and respond. When governments allocate resources, the military is given 100 or more times more than health and pandemic preparedness. We need to reverse the trend and catch up with the world threats. We need to increase investment in surveillance and in the overall healthcare system.

It also requires investment in improving hygiene and sanitation, upgrading of slums and informal settlements, investing in health research, investment in regulation and enforcement. It also requires changes in behavioural patterns. For example, people should not touch their faces so often, they should wash hands more often. Such measures can reduce the risk of infectious diseases. The current pandemic has made people aware of this. I hope we can use this as an opportunity to learn, so that we do not have another pandemic and also are better able to manage other systemic risks such as climate change.

@ian_goldin

AFTERSHOCKS#COVID-19

PR in times of Corona

The impact of COVID-19 can be gauged from the simple fact that when the dust settles in the post-COVID-19 world, countries won't be in the same stage as they were till December 2019. In fact, relations already appear to be shifting. In the third week of March when China offered Brussels to provide more than 2 million medical masks, 50,000 coronavirus testing kits to help the European countries, Ursula von der Leyen, European Commission president, said "China has not forgotten that in January, when it was the centre of the outbreak, the EU helped." Before that China had sent 300 intensive care doctors and a planeload of medical supplies to Italy and announced assistance to Serbia, after their requests for support went unheard by neighbours in Europe. "We will remember those who were close to us in this difficult period," said Luigi Di Maio, Italy's foreign minister, in response to China's goodwill packages. Analysts say China's move is to exert diplomatic influence.

"We are doing instead of talking. We are friends, not enemies. Could the American do the same to Chinese?" China's ambassador to South Africa Lin Songtian has tweeted. In the face of the bloc's disputes with its own rival, the US, Beijing appears to forge closer relations with the EU by rebranding its image of an authoritarian incubator of a pandemic. Is there some ulterior geopolitical ambition on its mind? Or else, how can one explain a recent threat by Beijing to cut off pharmaceutical supply to the US after which it will be "plunged into the mighty sea of coronavirus"!



^ Workers disinfect the interiors of a passenger bus in Ahmedabad, Gujarat

enjoying the benefits of globalisation, policymakers forgot the ill-effects of a free market world. Weak healthcare systems and their impacts are playing out at globalised scale. So, a near non-existent healthcare system in the US couldn't manage an infection from an emerging economy like China. And before China clamped down in a massive scale to curtail the spread, two of its citizens had already landed in Italy, spreading COVID-19 undetected. Italy's complacency in tackling infection domestically led to a wider spread, even in faraway India.

"It would be overly simplistic and inaccurate to describe globalisation as either "good" or "bad" for health," wrote Kelley Lee, London School of Hygiene, in a paper, *Globalisation: what is it and how*



does it affect health? Lee says spatial change is leading to increased migration of people throughout the world.

A global health security index did a country-wise assessment of pandemic preparedness and found that not a single country is prepared. Most countries lacked foundational health systems capacities vital for epidemic and pandemic responses. Of the seven categories, this was the lowest scoring category. The average score was 26.4 out of 100. About 131 countries, including several high-income countries, were in the bottom tier of this category. Only 11 per cent countries showed plans to dispense medical countermeasures during health emergencies.

The pandemic has brutally shattered the belief that the private sector-led health services are efficient and responsive. At least, it makes the case for a more robust and public-funded response system when every country's infection is globally contagious. In the face of COVID-19, Italy—a high income country—looks as helpless as any poor country without any semblance of an organised public health system. In the 1990s, Italy privatised parts of its healthcare delivery system. A comparison of mortality rate before and after privatisation found public spending was significantly associated with reductions in avoidable mortality rates over time, while greater private sector spending was not at the regional level. The country has also the second highest average life expectancy in Europe, reaching 79.4 years for men and 84.5 years for women (2011 data).

The US is facing flak from its own experts for not testing adequately and for delaying testing for about two weeks. The country couldn't manufacture the test kits at the right time, thus delaying the most critical aspect of containing the virus spread. The White House, the Centres for Disease Control and Prevention and the Food and Drug Administration for long debated and discussed and delayed the kits' manufacture. There was scarcity of kits thus letting out many with the virus freely moving around and transmitting it to others. This explains why 38 per cent of the US' COVID-19 patients were below 55 years of age, unlike elsewhere. It indicates undetected patients and unbridled transmission, a scenario now feared in developing countries.

The pandemic also unveiled another aspect of globalisation. When it comes to profit or wealth, most countries adapt one mode. But when it comes to a global emergency, they just adopt the opposite of what globalisation means. Desirably, countries have sealed their borders. There has been selective stopping of trade. While WHO minced no words in criticising these restrictions, not a single public health expert was willing to say that this was a much-needed step. Whether or not this step led to containment would remain a matter of sharp debate, but what would remain undoubtedly a fact is that when a



Kenyan health workers dressed in protective suits walk after disinfecting the residence where Kenya's first confirmed coronavirus patient was staying, in the town of Rongai

health emergency strikes, all principles of globalisations are thrown to the winds.

A few countries moved a step further. They stopped export of Active Pharmaceutical Ingredients and PPEs. Despite continuous appeals by WHO, these countries showed their selfish attitude because on one hand, the ban on export may lead to access Personnel Protective Equipment in one country, and on the other, countries may badly be falling short of it putting their frontline health workers at risk.

WHO, while declaring the outbreak as global Public Health Emergency of International Concern prepared a global plan for the pandemic on January 31. The plan said WHO would require $637 million. By mid-March not even one-third has been collected despite vehement appeals that there is acute shortage of personal protective equipment and masks for the frontline healthcare workers. Till date, various countries and agencies have donated only $206 million. This shows how countries have decided to leave a global health body in the lurch when they were required to help. Harari in his interview clearly pointed out that if countries remain short-sighted and do not help other countries, they would end up only increasing their own risk.

The COVID-19 pandemic has brought out the fragile side of globalisation: a growing and imbalanced dependence on each other. Take China for instance. It almost controls the supply chain of goods of the world because it is the factory to the world. It seems a truck driver in China couldn't join work due to COVID-19; the shipment of solar photovoltaic chips couldn't reach India on time unsettling the country's solar energy target. Thousands of fisherfolk in India's coastal areas are losing their livelihoods because there is a curb on shipping due to the pandemic.

The global response has also proved that the pandemic might actually push countries faster towards de-globalisation. Many countries are already moving towards this phase to protect national interests. This is not the first time that a disease is derailing the process of globalisation—the Spanish Flu too had killed the first wave of modern globalisation. The difference is this time globalisation is truly global. A recent Bank of America report states that 80 per cent of multinationals have invested in plans to repatriate part of their production—known as re-shoring—a trend that COVID-19 could turn into a tidal wave.

However, globalisation has also made the exchange of critical information faster. China did the genome sequence of the virus within a record time of 20 days. It shared the sequence on publicly accessible platform. This helped researchers across the world to develop diagnostic assays. This was impossible had China not shared it. Very quickly, scientists in various parts of the world started collaborating on research on drugs and therapeutics. WHO is also leading multi-country trials of these products. The global scientific community is collaborating well and there is evidence for this. Vaccine prototypes exist and soon there will be human trials.

A deadly debt blow

When COVID-19 struck, the world was already reeling under another pandemic: debt. At the end of 2018, the total debt (including public and private, the later being accounting for more) was $229 trillion. This was two-and-half times of the total world GDP. In developing countries, private debt is 73 per cent of the total debt. Developing countries (excluding China) are expected to incur an economic loss of over $220 billion. With this kind of debt, both public and private entities would find the new economic disruption by COVID-19 unbearable. At least 23 developing countries would be directly impacted by the pandemic, thus, adding fresh debt to their accounts. "Growing inequalities over several decades have eroded most households' spending power since long before the COVID-19 outbreak, and they now pose serious headwinds against a robust post-outbreak recovery," warned the UN.



COVER STORY / CORONAVIRUS

IS COVID-19 DISEASE X?

The pandemic could be the unknown disease World Health Organization warned about in 2018

VIBHA VARSHNEY

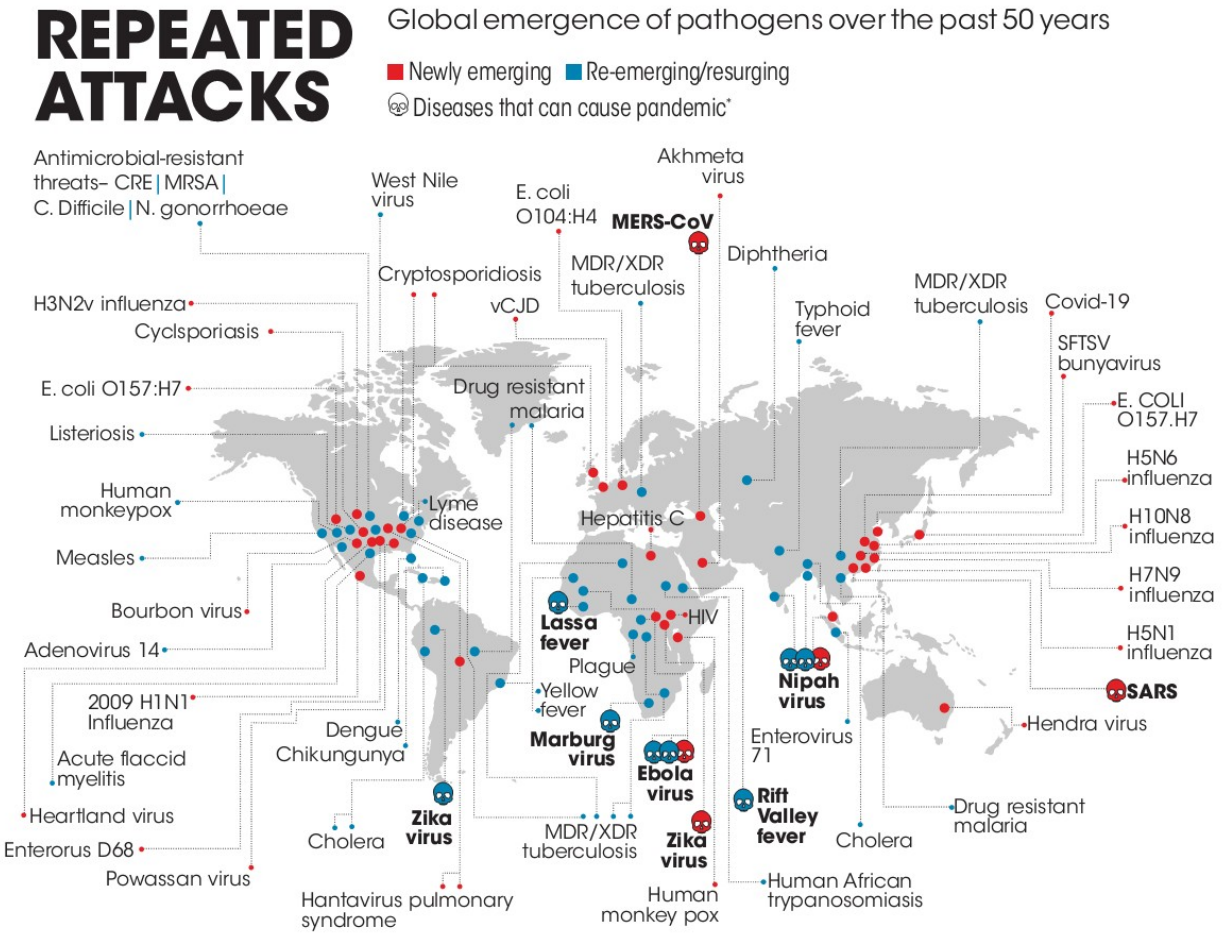
IN 2018, the World Health Organization (WHO) released a list of 10 diseases that can cause epidemics and all were viral in nature. Besides the usual suspects such as zika, Ebola and Severe Acute Respiratory Syndrome or SARS (triggered by a coronavirus), it also had a Disease X, to be caused by an unknown pathogen (see "Repeated Attacks", p37). There is now a growing consensus that COVID-19 is Disease X.

"This outbreak (COVID-19) is rapidly becoming the first true pandemic challenge that fits the Disease X category," writes Marion Koopmans, head, viroscience department, Erasmus University Medical Centre in The Netherlands in journal *Cell*. Peter Daszak, who was part of the WHO team that collated the 2018 list, writes in the *New York Times* that they had postulated that Disease X would be a viral originating in animals and would emerge in a place where economic development drives people and wildlife together. The group predicted that the disease would be confused with other diseases during the initial stages and would spread quickly due to travel and trade. Disease X would have a mortality rate higher than seasonal flu and would spread as easily as the flu. It would shake the financial markets even before it became pandemic. "In a nutshell, COVID-19 is Disease X," he writes. This flies in the face of WHO's expectations that the next pandemic would be that of influenza.

CONTAINMENT MEASURES HAVE NOT EVOLVED SINCE THE SPANISH FLU IN 1917-18 THAT KILLED MILLIONS

The devastation caused by COVID-19 pandemic is a rude reminder of the fact that the world needs to better understand and manage epidemics. "Our understanding of infectious diseases has improved. But we don't fully understand all aspects regarding the emergence of epidemics," says Suresh V Kuchipudi, clinical professor and associate director, Animal Diagnostic Lab, Department of Veterinary and Biomedical Sciences, the Pennsylvania State University. He, however, highlights a similarity among the past few epidemics. "RNA viruses have caused all the recent major outbreaks, including COVID-19," he says. Due to their inherent nature to mutate and evolve, RNA viruses are more likely to cause future epidemics. WHO tracked 1,483 epidemic events in 172 countries between 2011 and 2018. Nearly 60 per cent of the recent epidemics were zoonotic, of which 72 per cent originated in wildlife. Besides COVID-19, WHO reported nine disease outbreaks in the first 79 days of 2020.

Climate change and environmental degradation are making matters worse as they help viruses to mutate faster, thus increasing the rate of spread. RNA viruses have mutation rates that are up to a million times higher than their hosts. These high rates are correlated with enhanced virulence and evolvability, traits considered beneficial for viruses, wrote Siobain Duffy, associate professor at the School of Environmental and



Source: *As per WHO's 2018 Annual review of diseases prioritized under the Research And Development Blueprint; A World At Risk report 2019 by Global Preparedness Monitoring Board

GRAPHIC: RITIKA BOHRA / CSE

Biological Sciences, Rutgers, The State University of New Jersey, in *PLoS Biology* in 2018.

Viral diseases are difficult to control and the limited knowledge about them adds to the challenge. Despite decades of experience, scientists are not even close to finding an effective method to contain a viral outbreak. In fact, the currently used contaiment methods such as social isolation and closing down of schools were also used during the deadly Spanish flu in 1917-1918. The methods did not work then, and they do not seem to be working now. Even the much promoted hand washing might not be as effective as is being expected. Researchers at the University of Hong Kong found that personal protective measures such as hand hygiene or face masks and environmental hygiene measures such as improved hygiene and environmental cleaning do not help reduce transmission of influenza.

Despite the mounting threat, there are no global comprehensive surveillance efforts that proactively monitor the emergence of potential pandemic viruses. In 2018, a project (Global Virome Project) was launched to develop a global atlas of most of the planet's naturally occurring potentially zoonotic viruses over the next 10 years. Scientists today know just over 260 viruses in humans, which cumulatively account for just 0.1 per cent of potential zoonoses. In other words, the world remains ignorant about 99.9 per cent of potential zoonotic viruses.

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GOVERNANCE / HEALTH



Perpetually on antibiotics

India has no law to regulate the manufacture and sale of poultry feed laced with antibiotics

BHAVYA KHULLAR and **RAJESHWARI SINHA**

DIVANSHU PARUL'S mill in Mohali, Punjab, produces nearly 10 tonnes of poultry feed every day. He adds a sack of supplement containing antibiotics to the feed as routine practice. The product is bought by customers like Irshad Ali, who owns a poultry farm in Bulandshahr district of Uttar Pradesh, but is not aware about the presence of antibiotics in it. "I give it to all the birds in all seasons for growth, especially during their first 14-15 days," says Ali.

Antibiotics in feed allow farmers a lower feed conversion ratio, which means that the farm animals attain maximum weight in fewer days and hence need lesser feed. It also helps in disease prevention. But studies have linked the use of antibiotics in poultry feed to development of antimicrobial resistance (AMR) in humans through contact with animals, consumption of meat or environmental exposure to soil and water contaminated by animal excreta, and has become a looming public health threat. However, those who sell poultry feed laced with antibiotics in open market or online are not breaking laws because there virtually aren't any. "We don't need licenses for feeds as there is no regulatory authority," says a senior representative of the Compound Livestock Feed Manufacturers Association of India, requesting anonymity.

Poultry feed is a thriving business in India, with 63.8 per cent of the feed manufactured in the country catering to poultry, followed by dairy (29.6 per cent) and aquaculture (5.8 per cent), as per the global feed survey of 2019 conducted by Alltech—a private multinational company headquartered in the US. The survey says there are around 1,400 feed mills in India. Some of the key ones are Suguna, Godrej Agrovet, Shanthi Feeds, Noventech, Kwality, Komarla Feeds and Japfa Comfeed. Delhi-based non-profit Centre for Science and Environment (CSE) reached out to three—Karnataka-based Komarla Feeds, Haryana-based Skylark Hatcheries and Tamil Nadu-based Krishi Nutrition Private Limited—as potential customers because information on feed constituents was unavailable in public domain. All the companies accepted that their feeds contain antibiotics or medicines. Animal husbandry officials and academicians in six important poultry-producing states of India—Andhra Pradesh, Haryana, Karnataka, Punjab, Tamil Nadu and Uttar Pradesh—also confirmed that a variety of antibiotics, such as

PHOTOGRAPH: VIKAS CHOUDHARY / CSE



Consumption of poultry fed on antibiotics leads to antimicrobial resistance in humans

ciprofloxacin, levofloxacin, erythromycin, nalidixic acid, neomycin, kanamycin, avilamycin, apramycin and flavomycin, are administered to poultry through feed for growth promotion, in response to a questionnaire by CSE. Ciprofloxacin and levofloxacin belong to the class of fluoroquinolones used to treat tuberculosis in humans.

CSE research found that feed supplements laced with antibiotics are also available in the market (see 'Who sells what' on *p*40). Many of these, such as erythromycin, ciprofloxacin, furazolidone and doxycyclines, are important in clinical practice for treating humans. There are also antibiotics such as tylosin and enrofloxacin which are not used directly in humans, but the antibiotic classes they belong to—macrolide and fluoroquinolones—are important for humans and can cause cross-resistance. These classes are also categorised as highest priority critically important antimicrobials (HPCIAS), as per the World Health Organization (WHO), and are also being used by companies. "Tylosin is the same class of antibiotics as azithromycin and clarithromycin that are particularly important for patients with severe infections like pneumonia and typhoid," says Sumit Ray, chief of the department of critical care and ICU at Artemis Hospital, Gurugram.

LOOPHOLES

Antibiotics are under the purview of the Central Drugs Standard and Control Organization (CDSCO) under the Ministry of Health and Family Welfare (MOHFW). In the Drugs and Cosmetics (D&C) Act, 1940, antibiotics are typically placed under Schedule H which makes it mandatory that they be sold only under prescription. However, when antibiotics are added to feed, the resultant product no longer remains under the purview of CDSCO or any other authority. "Feeds containing antibiotics are like borderline products. They contain drugs and antibiotics which are not claimed to be intended for treatment. There is no clarity on the definition or provisions for such products," a senior CDSCO official told CSE, requesting anonymity. Due to this loophole, state drug authorities have to resort to judicial routes to address the misuse of antibiotics. "We have filed and lost cases on feed supplements containing antibiotics," a Karnataka drug control official told CSE.

Though there are no regulations, there are advisories and guidelines. The Bureau of Indian Standards (BIS) provides norms for various animal feeds, such as cattle, fish and poultry. The poultry feed specifications (IS 1374) of 2007 mention that use of antibiotic growth promoters with systemic action are not recommended. Even the Department of Animal Husbandry and Dairying (DAHD) under the Union Ministry of Fisheries, Animal Husbandry and Dairying, had issued an advisory to all states and Union Territories in 2014 stating that antibiotics should not be allowed in feed and feed supplement as growth promoter. But these are all advisories and mostly ignored. BIS is now considering to ban use of all medically important antibiotics in feed as additive. The Food Safety Standards Authority of India is also considering regulation of feed, but it pertains to only cattle feed.

MOHFW banned use of colistin and its formulations in food-producing animals and animal feed sup-

WHO SELLS WHAT

Feed supplements loaded with antibiotics can be purchased from the market without prescription

Brand	Company	Antibiotic	WHO# category	Use of antibiotic in humans
Docomix	Provet Pharma	Colistin	HPCIA[$]	Febrile neutropenia, ventilator associated pneumonia*
		Doxycycline	Highly important	Infections of gastrointestinal and intra-abdominal tract, respiratory tract, urinary tract, genital tract, and surgical site, and patients with risk factors for rickettsial infection*
Erythrovet	Vetoquinol India Animal Health	Erythromycin	HPCIA	Infections of upper respiratory tract, acute rheumatic fever, arrhythmia jaundice*
Ermisol FS10	Provet Pharma			
Tylomix	Venky's	Tylosin (macrolide)	HPCIA	Respiratory, skin, soft tissue infections^
Tylotec 10	Provet Pharma			
Ticomaxin	Titan Pharma	Lincomycin	Highly important	Colitis
Chloran	Zydus Animal Health (Cadila Healthcare)	Chlortetracycline (tetracycline)		Patients with risk factors for rickettsial infection^
Titafura	Titan Pharma	Furazolidone (nitrofuran)	Important	Obstetrics and gynaecological, and urinary tract infections^
Avibac ZN 150	Provet Pharma	Zinc Bacitracin	Important	Prevent infections in minor cut, scrapes and burns
Ceprostin Plus	Vetneeds Group	Ciprofloxacin	HPCIA	Infections of gastrointestinal and intra-abdominal tract, urinary tract, eyes, ears*
		Colistin sulphate	HPCIA	Febrile neutropenia, ventilator associated pneumonia*
		Enrofloxacin (fluoroquinolone)	HPCIA	Respiratory and urinary tract infections^

[$]Highest Priority Critically Important Antimicrobials; #WHO List of Critically Important Antimicrobials for Human Medicine, 2019; * National Treatment Guidelines for Antimicrobial Use in Infectious Diseases of the Ministry of Health and Family Welfare; ^Use of antibiotic class (NOTE:The list is not exhaustive)

plements in July 2019. But this addresses the issue of antibiotic misuse in food animal sector only partially. In 2018, DAHD had recommended to CDSCO that colistin sulphate, zinc bacitracin and bacitracin methylene disalicylate (BMD) should not be used as feed premix, feed supplements or drugs. MOHFW banned colistin sulphate, but zinc bacitracin, BMD and other antibiotics are still allowed.

ACT NOW

To contain AMR, in line with how other countries are dealing with it, antibiotics should not be allowed in feed. We should begin with phasing out all antibiotics medically important for humans. CDSCO should amend the D&C Act to ensure that antibiotics are not available without prescription for any use in human and veterinary sector. Additionally, the D&C Act should be modified to give necessary powers to drug officials so that antibiotic misuse in feeds can be regulated. This will also help CDSCO regulate the import of antibiotic-laden feed supplements, which otherwise is not under its purview. CDSCO should also regulate the addition of loose antibiotics to feed separately. BIS should make the poultry feed specifications mandatory and develop necessary standards for other sectors. To complement the above, MOHFW should consider banning all medically important antibiotics for humans from use in feed or feed supplements. It should also ensure that colistin-laden feed supplements are not marketed or sold, as CSE found during its research despite ban. To support these measures, DAHD should encourage farmers to adopt better farming practices. DTE

@BhavyaSc @tweet_rags

(with inputs from Amit Khurana)



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ENVIRONMENT / FORESTS

Violaters' victory

Environment ministry makes it easy for rich companies to get away with violations

ISHAN KUKRETI
NEW DELHI

CALL IT reconciliation or compromise, but the Ministry of Environment, Forest and Climate Change (MOEFCC) has legitimised one of the biggest forestland encroachments in the recent past. On December 17, 2019, the ministry regularised and gave in-principle forest clearance to 174 hectares (ha) of forestland encroached upon for the past 12 years by Vedanta-owned Electrosteel Steels Limited (ESL) in Jharkhand's Bokaro district.

Over the years, the company constructed a steel-manufacturing plant on the site, which is fully functional now.

LIE DETECTED

ESL had applied for Environmental Clearance for the project in 2006-07. MOEFCC gave its consent, too. But the company provided incorrect information. ESL claimed that the project site was near Parbatpur village in Bokaro, but it has built the plant at Baghabandh village, about 5 km from Parbatpur, reveals the site inspection report of May 22, 2017 prepared by the divisional forest officer (DFO). Worse, the declared site did not have any forestland, but the actual construction site had fertile forestland.

ESL had ulterior motives in encroaching *gair mazarua*, or public land, notified protected forestlands, and land recorded by the government as "*jungle-jhaadi*", the report states. By regularising their illegal acts, "the company and its officers are trying to place misleading

PHOTO: INDSTEEL.ORG



Vedanta Group took over the Electrosteel Steels Plant in 2018

facts even before the honourable court," it adds.

Between 2009 and 2016, a total of 53 cases were filed against ESL employees. The state forest department also filed a case against ESL on November 20, 2010 to initiate proceedings under the Jharkhand Public Land Encroachment Act. These cases are presently with the Chief Judicial Magistrate, Bokaro. On August 29, 2018, the court dismissed the forest department's case stating there were still several pending cases filed by forest-dwellers for land ownership. While ESL claimed that it had purchased land from private individuals, the forest department has maintained that the land is notified forestland.

In 2018, MOEFCC revoked the Environmental Clearance to the project. The Jharkhand Pollution Control Board also withdrew its Consent to Operate. However, ESL moved the Jharkhand High Court and managed to get a stay on both.



While several cases were still pending, ESL levelled 164 ha of forestland and constructed the plant. And the DFO's site inspection report, which had strongly condemned ESL's action, finally proposed to regularise the project. The forest is already destroyed and the project itself gives employment to about 10,000 people, it states. It also proposes "exemplary penalty" to the company. MOEFCC has accepted the proposal.

WIN FOR RICH COMPANIES

Monetary penalty can hardly be a sound basis for condoning blatant violations. It will open an easy exit route for companies with deep pockets when the rights of forest-dwellers have been trampled upon. According to the Ministry of Tribal Affairs, till September 2019, of the total 1,10,756 claims filed under the Forest Rights Act, Jharkhand has approved only 62,051 claims. And the average size of the Individual Forest Rights recognised is as small as 1.03 ha.

Past records show similar ex-*post facto* regularisations with exemplary penalty. Kanchi Kohli, a researcher at Delhi-based think tank Centre for Policy Research, says, there are penal provisions in national- and state-level forest laws that can be invoked for cases involving construction without approval, encroachment and illegal felling of trees. "The Shah Commission inquiry on illegal mining in Odisha and Goa found many projects were working without proper forest or environment clearances. Such projects have been regularised or allowed to operate after payment of penalties," she says.

In fact, MOEFCC has already formalised the process of providing ex-*post facto* environmental clearance. In a March 14, 2017 notification it has given the provision for ex-*post facto* clearance to projects that have violated the Environment Impact Assessment (EIA) Notification, 2006. A draft EIA notification, 2020 released by MOEFCC on March 11, aims to further strengthen the ex-*post facto* clearance process.

"EIA Notification, 2006 lays down the requirement for environment clearance prior to the project, but the new draft includes a section on violations which undermines this very requirement," says Kohli. "It signals that non-compliance with the regulation can be condoned," she adds.

This also holds true for forest clearance, a precursor to environmental clearance. At a ministry's meeting held on October 26, 2017, it was decided that forestland diversions without forest clearance will attract a penalty that is five times the Net Present Value of the forestland.

"This is worrisome as forest clearances are anyways given without due diligence," says Sharadchandra Lele, distinguished fellow at Ashoka Trust for Research in Ecology and the Environment. He is studying the process of granting forest clearance to 130 large mining projects in the country. "Collectors have admitted that FRA process is completed without ensuring grant of Community Forest Rights to people. So on one hand, clearances are not granted carefully and on the other, those who violate even that process are now being given *post facto* clearance," he adds. DTE

@ikukreti

PATENTLY ABSURD / LATHA JISHNU

A dirty US fight to control WIPO

EARLY IN March, the World Intellectual Property Organization, or WIPO as it is known, said it had nominated Daren Tang Heng Shim as its new director-general to take over from Francis Gurry whose term ends in September. The announcement followed several rounds of voting which eliminated eight of the 10 aspirants, leaving Tang of Singapore and Wang Binyang of China to fight it out. In any case, the contest to gain control of the UN agency which oversees the international property (IP) system globally was only between these two.

Tang, who heads the IP Office of the Singapore government, had a formidable opponent in Wang, a deputy DG at WIPO and a well regarded professional with nearly three decades at the Geneva-based organisation. But she was undercut by a fierce US campaign against China which came in the wake of trade war that Donald Trump had launched against the Xi Jinpeng regime, accusing it of IP theft. A trade pact signed in January to end the row does not appear to have changed anything.

Tang, backed by the US and its allies, won after a particularly vicious campaign that was led by top aides to Trump and roped in senators and a host of others. In the weeks preceding the final round, Peter Navarro, assistant to the US president on trade and manufacturing policy, wrote in *Financial Times* of London that handing the reins of WIPO to the Chinese would be "a terrible mistake". A commentator from an ultra-right think tank went further, saying it would be akin to "giving the world's largest hen house to the world's largest fox". It was a comment as distasteful as it was inappropriate; WIPO is not a repository of patent secrets but only promotes the protection of IP.

The hen house imagery which became popular with America's China-bashers doesn't hold. The reality is that China has established itself as an IP powerhouse in the last couple of years, overtaking the western nations and Japan in its scientific and technical prowess (see 'The Chinese patent juggernaut', *Down To Earth*, 16-30 April, 2018). This has unsettled the US which has been toppled from its decades-long top position. With the China emerging as the world's most prolific filer of patents—according to WIPO it accounted for nearly half of the 3.3 million global patents in 2018—and leading in next generation technologies such as 5G and Artificial Intelligence, the country has become as tough in enforcing and protecting IP rights as its worst critics.

China loses to Singapore in American smear campaign but the US will have to contend with an IP powerhouse

In fact, current WIPO chief Gurry, an Australian, had said in 2018 that China's emergence would upset the US because the rise of a new competitor always upsets from the existing order. To quote from an interview, Gurry had stated: "China is here as a major technological power. Now we have a new competitor, and the game changes."

But in terms of global power politics, the game did not change all that much. Wang got only 28 votes from WIPO's 83-member coordination committee which elects the DG. China says it's because the US put pressure on smaller countries who had been threatened with loss of World Bank and IMF loans. That may be true. But it's also true that China's innovation supremacy frightens many nations. DTE

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Palette

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RECOMMENDATIONS: PANDEMICS

DOCUMENTARY

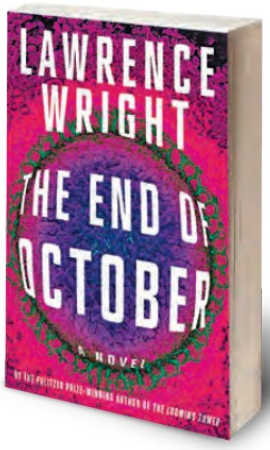


Netflix's chilling new documentary, *Pandemic* is on how prepared the world is to deal with a new pandemic. The six-part series begins with the scientific premise that we are due for a new fast-moving deadly virus (how true!). It warns that if the influenza virus killed 50-100 million people 100 years ago when the population was just 2 billion, how many will be killed by COVID-19 when the world population is nearly 8 billion? The documentary vividly captures the widespread disruption to markets, workplaces, flight patterns and food production.

BOOKS



Published in March this year, *The Companions* by Katie Flynn is set in a future California where residents are quarantined because of a deadly virus. Borders are sealed, survivors live under observation and are sequestered. What is bizarre is that the dead people upload devices of their own consciousness called "companions". The book questions what separates humans from machines.



"When I read the accounts of the spread of coronavirus, I felt I was reading chapters from my own new book," says Lawrence Wright, whose *The End of October* will be published on April 28. The book describes what kind of global chaos a pandemic can unleash on the world. The novel's main protagonist is a microbiologist and epidemiologist who is on the ground trying to slow the spread of the virus and engineer a vaccine as the pandemic cripples countries around the world.



WONDER WEED

THE MENACE OF WATER HYACINTH CAN BE TACKLED WHILE MAKING MONETARY GAINS AND ENRICHING THE TRADITIONAL CRAFTS OF INDIA

SWASTI PACHAURI

PHOTOGRAPHS: VIKAS CHOUDHARY / CSE, SWASTI PACHAURI



The thick mats of water hyacinth can suffocate waterbodies. But when dried, its stems can replace sturdy materials like cane and bamboo



AT TIMES all it takes to win a war is a novel strategy. And that's precisely how several communities and organisations in the country are trying to gain the upper hand over an old enemy—the deceptively beautiful water hyacinth.

The perennial aquatic plant's lilac, white and violet flowers with floating thick, glossy dark green leaves are believed to have caught the attention of the Britishers, who brought it to the country towards the end of the 18th century. Since then, the plant, known as *Eichhornia crassipes* in scientific lexicon, has spread widely, choking ponds and lakes, invading paddy fields and clogging water supply pipes. Today, it is one of the fastest growing plants known. By duplicating itself in less than two weeks, it suffocates the waterbody, depletes it of oxygen and blocks sunlight from reaching other species. The impact is so severe that it is said an Act was introduced in 1936 to "provide for the destruction of water hyacinth in Bengal". Probably since then, the plant has also been referred to as the "terror of Bengal".

In 1999, Punjab undertook a military operation to end the march of water hyacinth in Harike lake, the largest wetland in north India. Hyderabad in 2017 initiated a massive water hyacinth clearing project from its 53 lakes at the cost of ₹17 crore. But such efforts mean little for a plant whose seeds can remain dormant deep in the soil for almost 30 years.

The only way to manage the weed is by making it economically and ecologically useful, says Juhi Angam from Ukhrul district of Manipur. For the past few years, she has been leading a self-help group of 100 women who twist and twirl the dried stems of water hyacinth and water reed to create a myriad of products, from bags and baskets to purses and lamp shades. A local company, Chuimeiyao Handloom Weavers cum Handicrafts CS Ltd, markets the products in places as far as Delhi, popularising this new craft.

"This has made us financially independent and brought us international recognition," says Angam, adding that typically, an artist takes a day to weave a bag of medium size. At Dilli Haat, an exhibition ground in Delhi, these bags sell at anywhere between ₹700 and ₹1,000.

Since 2011, conservation group World Wildlife Fund (WWF) has also tied up with the Punjab forest department to promote crafts made of the weed. It has mobilised women from Churian and Sudhian villages along Harike lake for making handicrafts from it. WWF says the arrangement has the managers of the wildlife sanctuary happy because the sales of these handicraft can now pay for extraction of the weed. The communities also no longer feel alienated from the wetland and respect its ecological values.

The North Eastern Development Finance Corporation (NEDFI) situated in Assam, in collaboration with North Eastern Council (NEC) has also championed the cause of promoting water hyacinth crafts under its market portal "Aqua weaves". NEDFI explains how handicrafts made using water hyacinth makes more sense when compared with cane and bamboo products. According to NEDFI-NEC, the raw material is available in plenty, and for free. Even after harvesting, it takes just about 15 days for the plant to regrow. Besides, extracting the fiber does not require much skill or labour. All that one needs to do is identify the mature plants, which are 40-70 cm long and 1-3 cm thick; harvest those; remove all leaves and leave the stalks for drying in the sun. Within five to six days the stalks turn brown and can be used to make artefacts. The dry stems, which are as sturdy as cane and bamboo, can also be directly used in preparing furniture, photo frames.



PHOTOGRAPH: SWASTI PACHAURI

WATER HYACINTH IS AVAILABLE IN PLENTY AND FOR FREE. EXTRACTING THE FIBRE ALSO DOES NOT REQUIRE MUCH SKILL OR LABOUR

In a bid to diversify its product range and make the products more appealing, NEDFI-NEC have trained artisans to make jewellery and slippers that have huge demand by hotels and the hospitality industry. From time to time, they invite professionals from Thailand, where the craft has been in practice for over 40 years, to train artisans in braiding and product finishing.

It's time state governments recognised the potential of water hyacinth in promoting alternative livelihoods in rural as well as urban areas through self-help groups. This can herald a happier ending to the protracted war. DTE

(The author is social sector consultant who has worked as Prime Minister's Rural Development Fellow in Seoni district of Madhya Pradesh)

Obituary

THE FEARLESS

Abhay Flavian Xaxa (1983-2020)

BY MAMATA DASH

I MET Abhay Xaxa around 2007-08, but had heard about him much before. His name would regularly come up in conversations on the rights of *Adivasis* and *Dalits*. I distinctly remember how people would say they were waiting for Abhay to return to India to strengthen the tribal rights campaigns. His regular references intrigued me. I often wondered how important he was to the people. Abhay, at that point in time, was in the United Kingdom doing his Masters in Anthropology from the University of Sussex. Once he returned, I realised why he was needed in India.

He was restless, argumentative and would never mince words to convey his dissatisfaction over how the problems of *Adivasis* and *Dalits* are dealt with in the country. He worked with and for people and tirelessly fought power centres and exploitation.

Abhay's insights are needed more now than ever. His intellectual rigour could put the most seasoned detractor to doubt. He nurtured people as much as he challenged their minds and arguments. His activism against state repression proved to be a hurdle for him in getting a stable job. People and organisations loved him as an activist but they saw him as a big risk to be formally taken onboard. We failed him.

It was his 37th birthday on March 13. He appeared on a social media site on March 14 to thank his friends for the wishes. And in the evening, the news of his death shook the soul out of me. How could he go so early, so young?

He will live in all our struggles and triumphs, even though our eyes and hearts will search for him in all the protests, meetings and debates. The intellectual discourse that he pursued and pushed us to understand must be carried forward.

Abhay, the fearless. Go well, comrade... *Hul Johar.*

One cannot forget Abhay. His poetry that echoes everywhere, in forests and farms, makes him an immortal companion:

I refuse, I reject and I resist
I am not your data, nor am I your vote bank,
I am not your project, or any exotic museum object,
I am not the soul waiting to be harvested,
Nor am I the lab where your theories are tested,
I am not your cannon fodder, or the invisible worker,
or your entertainment at India Habitat Centre,
I am not your field, your crowd, your history,
your help, your guilt, medallions of your victory,
I refuse, reject, resist your labels,
your judgments, documents, definitions,
your models, leaders and patrons,
because they deny me my existence, my vision,
my space,
your words, maps, figures, indicators,
they all create illusions and put you on pedestal,
from where you look down upon me,
So I draw my own picture, and invent my
own grammar,
I make my own tools to fight my own battle,
For me, my people, my world, and my Adivasi self! DTE

(The author is a human rights activist)

@downtoearthindia



ILLUSTRATION: RITIKA BOHRA / CSE

Palette / FOOD

Tangy taste

LITTLE KNOWN OUTSIDE THE NORTHEAST, THE PEEL OF A WILD ORANGE ADDS FLAVOUR TO SEVERAL DISHES

CHITRA SUBRAMANIAM

CALL IT *heiribob*, *hatkora lemon* or *shatkora*, the zingy flavour of this cooking ingredient will leave you smacking your lips while invigorating your mind and soul. Jeena, who presented dried peels of this wild orange to me at Lookact-east at Dilli Haat in New Delhi, explained the ingredient is widely used in Manipur, especially among the Meitei ethnic group.

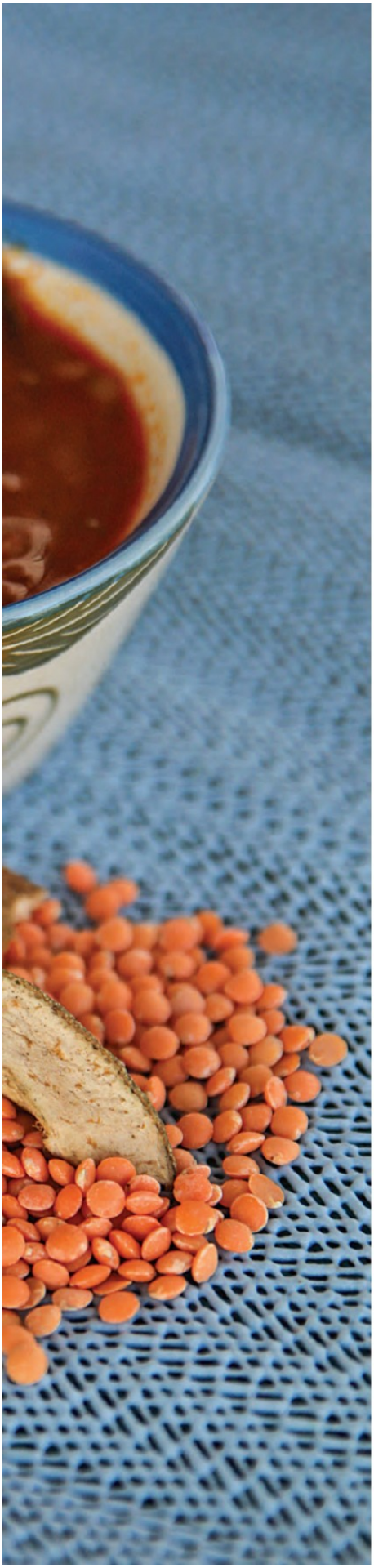
Heiribob, as it is called in Manipur, grows wild, especially in Tengnoupal district there. In fact, it is abundantly available in the entire Northeast, and even in West Bengal. In fact, the Northeast is a storehouse of citrus biodiversity with 23 species, one sub species and 68 varieties, writes S R Rao in his paper published in *ACTA Scientific Journal*.

Some papers have called it *Citrus laltipes* (Swingle), giving *tanaka* as its accepted name, but others have gone with *Citrus macroptera*. "Both belong to the sub-group '*papeda*' of the citrus genus," explains Rao, a professor at the biotechnology and bioinformatics department of the North Eastern Hill University in Meghalaya. In West Bengal, people have different



PHOTOGRAPH: VIKAS CHOUDHARY / CSE

Sun-dried peel of *Heiribob* releases its flavour when cooked along with Masoor *daal* in a pressure cooker



names for it—*hatkhora, satkara, shatkora* or *satxora*. But despite its popularity, it is still not too well known in the rest of India. "*Hatkora* has been an underexploited citrus species. Considering its potential in Mizoram and the prospects for its export in neighbouring countries like Bangladesh, Burma and Thailand, its cultivation should be encouraged to increase farmers' income and overall fruit production of the state," writes Thakur Azad in a 2002 paper titled '*Prospects of Hatkora cultivation in Mizoram*'.

WHAT'S IN THE FRUIT?

A July 2019 study published in the journal *Toxicological Research* says *heiribob* is indigenous to Malaysia, Melanesia and Bangladesh. Its fruit has a bitter and very sour taste. So people prefer using its peel rather than the pulp. However, many use the pulp to make squash. The peel is used fresh or sun-dried, which lasts long. While some make candies from it, most use it as an ingredient while cooking for its nice citric flavour.

The peel is added to dishes to make meat and fish tender. It also helps dull their strong smell. When boiled with *daal* (lentil) along with other spices (see recipe) it adds a unique flavour. Boiled peels are delicious to chew on, though many prefer to discard it just the way they do with curry leaves or whole spices from foods.

In Bangladesh, it is typically used for preparing pickles. Here, it grows abundantly in most homesteads and hill tracts of the Sylhet division. It grows as a tree in moist or loomy fertile soil and bears fruits from October to December. In local markets, a single fruit costs between ₹20 and ₹50. Given its fruity fragrance, the wood is extensively used in the perfume industry.

In the Northeast, *heiribob* is extensively used as a folk medicine. It can treat hypertension, stomach pain, alimentary disorders as well as common fever. Epidemiological studies show it possesses anti-inflammatory, anti-atherosclerotic, anti-cancerous, anti-mutagenic, anti-bacterial and anti-viral qualities, states *Toxicological Research*. Its study investigated the antiproliferative activity of *C. Macroptera* against Ehrlich's Ascites Carcinoma, or tumour, in mice. Its use considerably inhibited the tumour's growth.

So what can be better than a highly efficient medicine available as an inexpensive food product? DTE

(The author is a freelance features writer in Delhi. Among other things, she writes on unusual food)

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RECIPE MASOOR DAAL WITH HEIRIBOB

INGREDIENTS

Masoor daal: 100 g (washed and soaked in water overnight)
Onion: 1 small (finely chopped)
Bay leaf: 1
Heiribob: small piece
Ginger: one inch (finely chopped)
Oil: 2 tbsp
Turmeric: ½ tsp
Chilli powder: ¼ tsp
Maru marang: ½ tsp
Salt to taste

METHOD

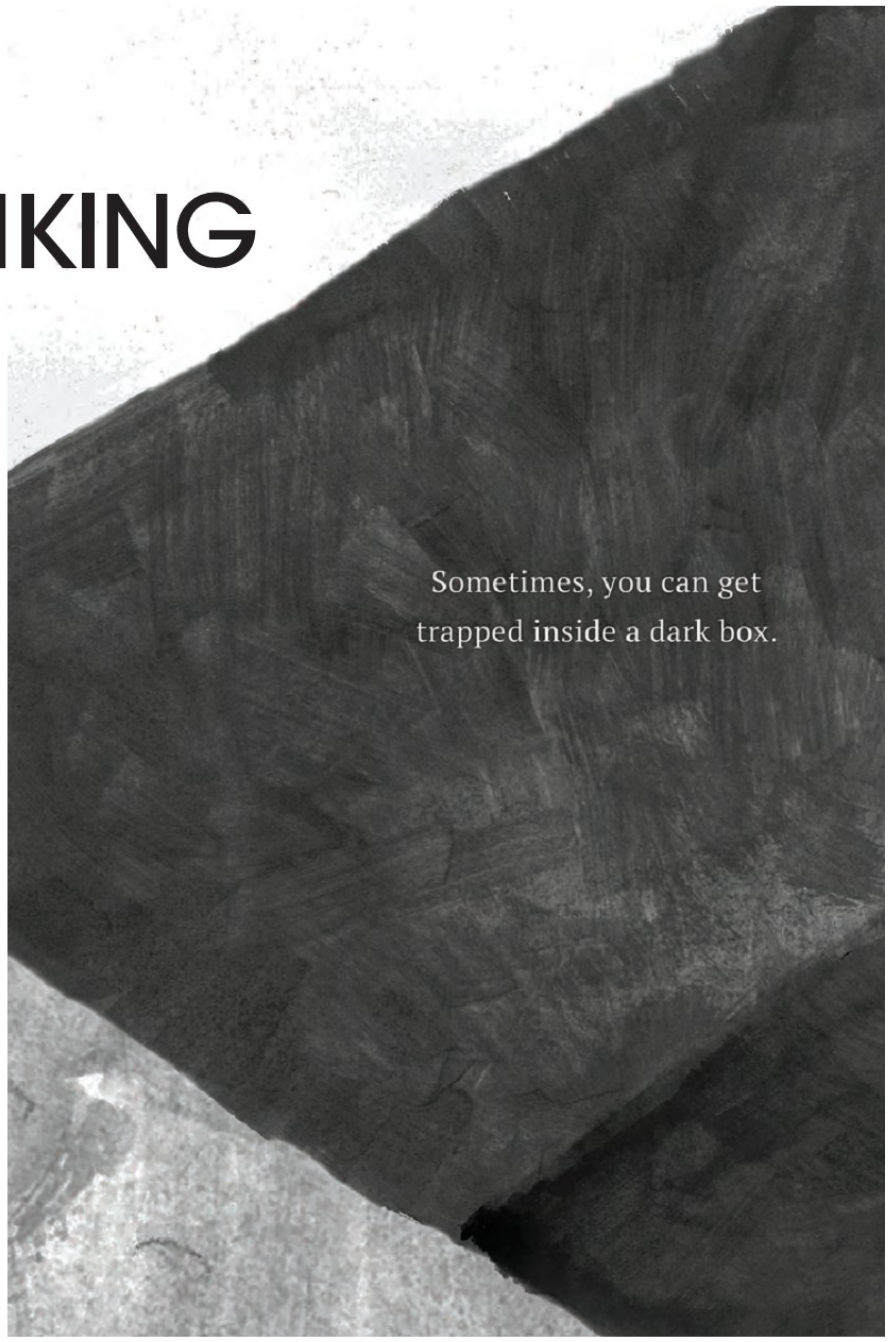
Heat oil in a pressure cooker. Add bay leaf, onion and fry till onion turns translucent. Put ginger, *daal*, turmeric, chilli powder, Heiribob, *Maru marang* and salt. Add water and pressure cook to 2-3 whistles. *Maru marang* is a roasted and ground mix of 1/2 teaspoon coriander seeds, 1/2 teaspoon pepper, 4/5 teaspoon pepper and a pinch of fenugreek seeds.

Palette / BOOK REVIEW

THAT SINKING FEELING

Inside a Dark Box is a peek into what depression can feel like to an individual

ADITYA MISRA





Inside a Dark Box
By Ritu Vaishnav
Publisher: Penguin Random House
Pages: 32
Price: ₹250

THE IMAGE above is of the first two pages of *Inside a Dark Box*. The comment-with-illustration format stays throughout the 30-odd pages of the book. Slightly larger than a pocket-sized dictionary, *Inside a Dark Box* depicts through such comments and illustrations the daily struggles of a depressed mind.

The author has not talked about depression—a global epidemic but still widely considered stigmatic—in a clinical sense. With barely 500 words, cover to cover, this was not the aim of the book. All it has is a message: people who have depression feel lonely and trapped, and that this feeling of helplessness can be overbearing. You try to fight but it keeps coming back.

The comments are like a sympathetic talk from a friend. One gets a sense that the writer

IMAGE COURTESY: PENGUIN RANDOM HOUSE



has faced depression first hand and is now trying to reach out to others. But it could just be her understanding of the subject or the phrasing of the comments that gives this impression.

The charcoal-black-and-white illustrations add to the feel of the book to such an extent that they become its most important feature. The use of the grey shade and the box motif to depict feelings of being sad and trapped is not lost on the reader. One can call the book a visual representation of depression.

The tone of the comments never becomes preachy. Neither does the book attain the character of a self-help guide. The only advice *Inside a Dark Box* offers is that there is a need to keep looking for solutions. Even if they are not visible at first in the dark box of depression. DTE

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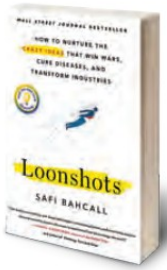
Palette / BOOK REVIEW

On loony ideas

WHY DO SOME 'CRAZY' ENDEAVOURS CLICK WHILE OTHERS DON'T? SAFI BAHCALL'S BOOK PROBES THE UNDERLYING MECHANICS

JOYJEET DAS





Loonshots: How to Nurture the Crazy Ideas That Win Wars, Cure Diseases, and Transform Industries

By Safi Bahcall

Publisher: Cambridge Scholars Publishing

Pages: 286; **Price:** ₹2,129

WHAT'S COMMON between Nicolaus Copernicus, Johannes Kepler and Edwin Catmull of Pixar? All three stuck their necks out and suggested the improbable: Earth and other planets move around a fixed Sun; the Sun exerts a force to move them; and computers can be used to create animation. People scoffed or laughed at the ideas, only to eventually accept what they had earlier called "crazy".

Today, even a primary school student would call the idea of the Sun, Moon and other planetary bodies orbiting a fixed Earth crazy. But that's what the world believed in the 16th century before Copernicus stated otherwise. Even after his death, the idea continued to be considered crazy by most until Kepler upped the craziness ante a century later.

By the 1960s, when Catamull tried to convince people of using computer to create animation, crazy ideas had wider acceptance. Yet, bumps remained. This is where Safi Bahcall's *Loonshots: How to Nurture the Crazy Ideas That Win Wars, Cure Diseases, and Transform Industries* comes in—to explain the bumps: why they are there; who puts them; how to negotiate them; where to look for solutions; when they will go away; and, what if they don't.

Bahcall, whose website

ILLUSTRATION: RITIKA BOHRA / CSE



describes him as "a second-generation physicist…and a biotech entrepreneur", lays out a three-Act study of offbeat ideas, when they would work and when they would stop working and how that could be addressed. In the process, he tells interesting tales—such as why the United States today has an edge in scientific research or how Hollywood happened—and presents several case studies from areas that lie on the cusp of technology and business: why did Steve Jobs' career stutter and then sway all the way to the banks? What did Disney not do that Pixar did?

Bahcall presents an interesting comparison between the state of matter and fate of a "loonshot"—"a neglected project, widely dismissed, its champion written off as unhinged". He proposes that it takes such "loonshots" to change the course of things: to make German U-boats go away in World War II; to beat cholesterols with statins; or to make trans-continental air-travel possible. All such ideas might not work. Even when they do, they would need fine-tuning and polishing. But when they take off, they fly.

The problem is to keep them flying. Why does a successful Polaroid go out of business while a Genentech successfully navigates its way through innovations? Bahcall puts it down to "structures" that would support the "loonshots". He contends that too much importance has been accorded to the concept of corporate "cultures" and too little to such "structures" necessary to cultivate wobbly ideas, to let them bloom and then to be utilised in real world. At the same time, it is important to not rub the real-world the wrong way and make it antagonistic to such ideas.

Bahcall broadly demarcates "loonshots" into two types, one less glamorous than the other, and makes the case of why it is important to be aware of the power of both. He also explains the fatality inherent in being dazed by one successful crazy idea to the extent of repeating it on a loop. And he chalks out a rough path for leaders to follow so that they can become "gardeners" to "loonshots", and yet keep themselves from becoming over-arching and from acting god.

ALL 'CRAZY' IDEAS MIGHT NOT WORK. EVEN WHEN THEY DO, THEY WOULD NEED FINE-TUNING AND POLISHING. BUT WHEN THEY TAKE OFF, THEY FLY

There are times when Bahcall seems to drift a little, when it takes time for his ideas to come through, or when you think "do I really need to know that". But two things work for Bahcall: the clarity of his thought and his ability to communicate it. He seems to have given his idea time, found gaps, addressed them until they could be put up to reasonable scrutiny. He draws upon knowledge as well as personal experience to make his point and does so in a fluid, but non-pedantic, language with dollops of references to social icons, Nobel laureates and pop culture.

On the face of it, the concepts Bahcall proposes are not easy to comprehend. They also may not be of interest to a wide group of people. But they instigate curiosity. So, for the inquisitive the book is worth the time. DTE

@joyjeetdas

Palette / OPINION

Nudge for nature

A nudge can be a promising new tool to encourage people to act in an environmentally benign way

PUSHPAM KUMAR



ILLUSTRATION: RITIKA BOHRA / CSE

ENVIRONMENTAL PROBLEMS are serious. Biodiversity loss, rising temperature, soil erosion and pollution are directly impacting our daily lives. Environmental policies are increasingly being informed by behavioural economics insights. "Green nudges", in particular, have been suggested as a promising new tool to encourage consumers to act in an environmentally benign way, such as choosing renewable energy sources or saving energy, food choices or farming practices (affecting soil, water and biodiversity).

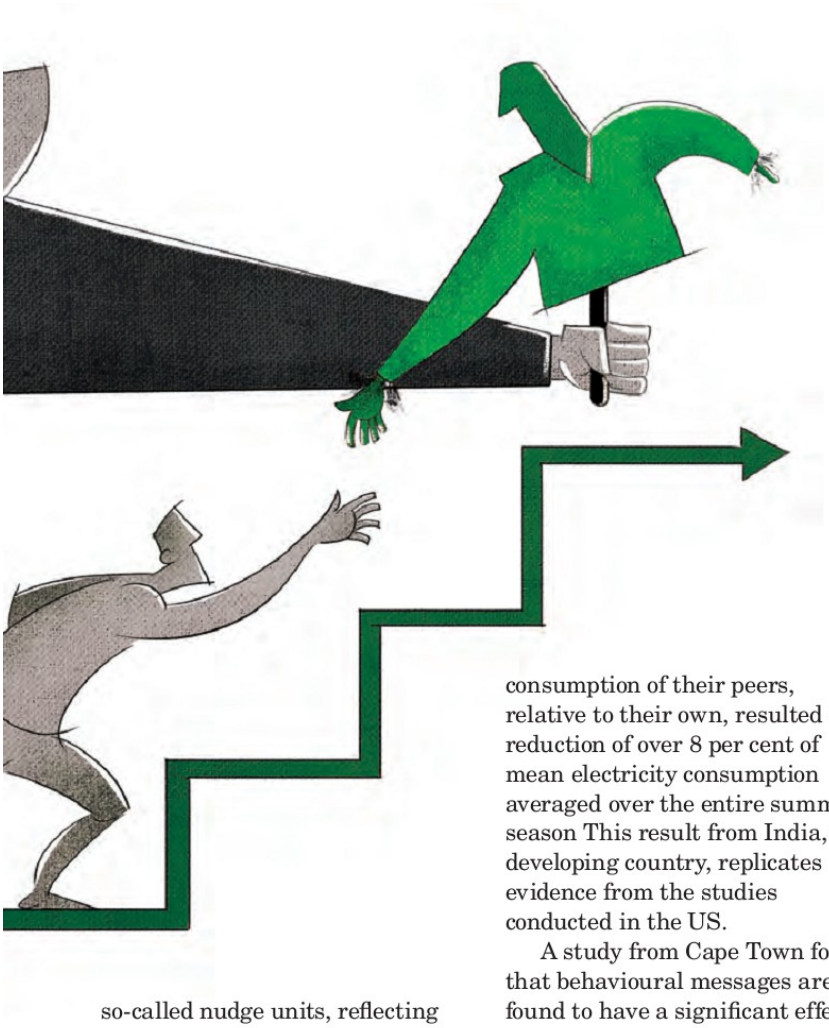
For instance, to reduce energy consumption, the US government sent letters to those who consumed a lot of electricity suggesting that their neighbours used less. This reduced their consumption. Providing hotel guests in the US with the information that 75 per cent of hotel guests reused their towels also increased the reuse of towels. A tax system designed by the UK government sent letters to people who were behind on their payments stating that "If you don't pay you will lose your car". This tripled the payments.

Africa's second-largest slum is located in Kibera, Kenya, a place with the rampant and lethal water-borne disease. Researchers were surprised to see the low uptake of water purification even after residents were given discount coupons for the chlorine solution. An extra trip to the store for chlorine solution was inconvenient for the households after making daily trips to a water source. Once placing large containers of community chlorine solution near the water source, which only dispensed the right amount, increased the uptake rates from 10 to 60 per cent. There are other examples on the prevention of excessive use of antibiotics, better collection of tax revenue and compliance with health food and environmentally-friendly action where people have been catalysed by using "nudging".

Behavioural science says that even small hassles can make it difficult to adopt a programme or product. Changing behaviour of people can yield favourable results including those for the environment and nature conservation.

A nudge is an aspect of how behavioural science can be applied in the public policy constituency. The inclusion of behavioural insights for guiding policy practitioners is becoming increasingly popular, through utilising the findings and methods provided by cognitive psychology and behavioural economics to formulate public policy. The most popularised application of late is "nudging" which emerged as an outgrowth of behavioural economics, and for which Richard Thaler won the 2017 Nobel Prize. Nudging entails a system of gentle encouragements, based on advanced knowledge of the decision-making process. Nudges are relatively modest interventions that preserve freedom of choice but that steer people towards particular directions. Types of nudges include the provision of information, changes in the physical environment, warnings or reminders, use of a green default option, and use of social norms and regular feedback.

Around the world, a number of governments have established



so-called nudge units, reflecting that the economic principle is increasingly being adopted in designing public policies, estimates the World Bank. The UK established the first Behavioural Insights Team in 2010 and other countries followed suit including the US, Australia, Canada, the Netherlands, and Germany as well as Asian countries such as India, Indonesia and Singapore.

There are some very successful examples of nudging behaviour for effective conservation policy. Power, a software company whose aim is to encourage people to use less energy, saved US $250 million of energy consumption without incurring any considerable investment, utilising the powerful behavioural moderator of social norms.

An example from India, where providing households information on the average electricity consumption of their peers, relative to their own, resulted in a reduction of over 8 per cent of mean electricity consumption averaged over the entire summer season This result from India, a developing country, replicates evidence from the studies conducted in the US.

A study from Cape Town found that behavioural messages are found to have a significant effect on water saving, resulting in an average reduction of water usage between 0.6 and 1.3 per cent across the various treatments. The results further confirm that raising awareness about how much water an individual consumes, and comparing this consumption level with peers, can go a long way in helping change individuals' behaviour regarding the use of a finite resource such as water.

Nudges can go wrong as well if they see as inconsistent with the interests or values of the people whom they affect. There are challenges for policymakers seeking to use nudges in reliable ways, even with significant potential and replica ability across populations. It's been suggested that monetary incentives coupled with peer comparisons may crowd out rather than co-benefit. When peer comparisons were coupled with small financial incentives on middle-income households in India, the peer comparisons nudges became ineffective.

Finally, we must understand people's response to policy design and its impact. Still today we have around a billion people in poverty, and Sustainable Development Goals 1 and 2 identified them as their priority. Poverty eradication, for example, can't succeed unless we understand what policy proves to be more effective in tackling material deprivation if all types—absolute, relative or transient). It is very appropriate that in 2019, the Nobel Committee has awarded three economists—Abhijit Banerjee, Esther Duflo and Michael Cremer—for their work on field experiments in research, to bring the principles of laboratory-style randomised, controlled trials to empirical economics. The same experiment-based approach can also be used in the wider context of health care provision, education, agriculture, and gender attitudes, besides natural resource management—forest, fish, coasts and carbon.

2020 draws special attention on the conservation of nature and biodiversity. The United Nations General Assembly will call a special session on biodiversity, which would discuss nature-based solutions, and the Conference of Parties of the Convention on Biological Diversity would discuss the strategy for the Global Biodiversity Framework. Nudging as a new tool has great potential to realise the ambitions of conservation and development. DTE

@down2earthindia

(The author is the chief environmental economist with the United Nations Environment Programme. The views expressed here are not necessarily a reflection of the organisation's view)

Civil Lines / RICHARD MAHAPATRA

A long economic quarantine

THE COVID-19 pandemic has not brought to fore the inequality that exists in our society. It is already accepted as an existential hazard in a free market regime. Rather, it shows how the economically marginalised groups suffer in the face of a health emergency of this magnitude. For example, the US. Media reports a large number of people did not approach health centres despite having symptoms of COVID-19 as they simply could not afford it. The US has the lowest per capita availability of hospital beds among developed countries and does not have a universal healthcare system. Its health insurance coverage is also not adequate. The result: several poor patients are forced to choose death over medical consultation.

India is presently on a warpath with the pandemic. Presently, all efforts are to stop the spread of infection. Experts say the spread will reach community transmission level by mid-April. Irrespective of this, Indians stare at the situation that Americans are currently dealing with. Government facilities are highly inadequate. Our out-of-pocket health expenditure is so high that it pushes people to poverty in the face of an emergency. In fact, poverty rate would rise by 3 per cent if these expenditures were added to poverty calculations. So, what will happen if COVID-19 spreads across the country? What will it entail for the country's largely poor population?

For India's poor, or the dominant rural population, it would be a double whammy. First, daily wagers are already facing job loss due to disruption in the economy caused by the pandemic. Many fisher folk have lost their livelihood due to restrictions on marine produce export. Second, people also have to incur medical expenditure—both for precaution and for treatment of COVID-19. A robust government healthcare infrastructure would have helped, but that is simply not there.

Add to this, the seemingly long lockdown across the country that restricts economic activities. For example, to stop mass gatherings many states have closed down shops, malls and even rural local markets. This is an induced demand suppressant. It aggravates the situation as the country is already under an economic slowdown, particularly in rural areas. States like Chhattisgarh, Jharkhand and Odisha are reporting drastic sales reduction in local markets.

But this economic quarantine will continue. A spell of erratic extreme rain events and hailstorms has already damaged crops in some nine states—a news that got buried in the COVID-19 deluge. Even before we are through the COVID-19 pandemic/economic quarantine, the India Meteorological Department's forecast says we will enter into a severe heatwave spell, starting April through June. Last year, we had one of the worst in recent past. According to *Lancet Countdown*, that documents climate change impacts on humans, in 2017 India lost 75 billion hours of labour due to rising temperatures as people could not take up regular and sustained work. Manual labour is still the spine of rural economy, gradually displacing agricultural income. It means millions of people are already under economic stress due to slowdown and the COVID-19 disruption will further push them to economic uncertainty. The World Meteorological Organization has already indicated erratic rainfall and more cyclones—June to October—for India this year, besides high temperature episodes. Thus, the majority of workforce in India engaged in agriculture has to endure the economic disruption spilling over to the whole year. At the end, what does it mean?

What will happen if COVID-19 spreads across the country? What will it entail for the country's largely poor population?

Within a period of time, people would have slipped further into economic poverty, restricting their capacity to bear shocks like extra hospital expenditure or to remain without regular incomes. But do they have a choice? DTE

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