

16-29 FEBRUARY, 2020

DownToEarth

FORTNIGHTLY ON POLITICS OF DEVELOPMENT, ENVIRONMENT AND HEALTH

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**Budget 2020
has all the
ingredients for
aggravating
farm distress**

P14

**Trump's
visit to India
could impede
access to
affordable
healthcare**

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CSR SPECIAL P24

UNMASKING CORONAVIRUS

The virus spread to 27 countries in just 31 days.
Is the world prepared for a pandemic?

The Centre for Science and Environment (CSE) has been working on policy and implementation with regard to waste management at the national and global levels. The Anil Agarwal Environment Training Institute (AAETI), a CSE initiative, recognizes the need to adopt resource efficient waste management regimes, and offers an advanced five-day training programme on 'Circular Economy & Resource Efficiency for Sustainable Waste Management'. The objective of the programme is to provide a better understanding of the key aspects of management of solid, plastic, biomedical, construction and demolition (C&D) and e-waste; feasibility of technologies involved in their treatment; regulatory frameworks; best practices and stakeholders involved.

Waste management practitioners, officials from central and state urban departments and municipalities, urban and town planners, village panchayat officials and members, academicians, students, and NGO representatives.

Anil Agarwal Environment Training Institute
(a Centre for Science and Environment
initiative), Nimli (near Alwar), Tijara,
Rajasthan



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Centre for Science and Environment

Contours of coronavirus

CALL IT the revenge of the bug. The new coronavirus, named 2019-nCoV, has done to the Chinese economy what US President Donald Trump could not do. It has wreaked havoc in the world's second largest economy; grinding it to a halt; shutting down its cities; and, isolating its people. Today, we are seeing perhaps the largest effort ever to contain the spread of this infection—Chinese President Xi Jinping called it a people's war on the virus. But the worrying question is this: with over 600 deaths and over 31,000 people infected in just about a month, how long will it last? The virus stays dormant for over two weeks—that is even if people are infected, the symptoms do not show. The good news is that the mortality rate is low; but on the other hand, the fear of contagion is high as the virus moves through the air from people to people. So, the answer is to ensure that anyone possibly exposed is isolated and quarantined.

But what does this mean for an inter-connected world, which has broken every record in terms of trans-boundary movement of people and trade? Consider this. In 2003, when the world witnessed the first such global health crisis, the Severe Acute Respiratory Syndrome (SARS), China accounted for only 4 per cent of the world's GDP. Today it is 16 per cent. Business begins and ends in China. It is the world's ultimate supply chain. So, this health crisis will disrupt business all across the world. Also, now, the movement of people is massive and this is why the movement of the virus is also so fast. There is no doubt that governments are stepping in; closing doors. But it shows our common vulnerability; how quickly a common cold can become a global contagion.

There is also more that we must discuss—more seriously than when we were confronted with SARS in 2003, and then with the Middle East Respiratory Syndrome (MERS) in 2012. The fact is that in these cases, including the 2019-nCoV, the virus found in bats has jumped from animals to humans. In the case of SARS, the World Health Organization (WHO) found that the civet cat, raccoon dog and badger were the most likely intermediate hosts. In the case of MERS, the camel was the intermediate host. The route of 2019-nCoV is not yet clear—the local market, which is seen to be the source of the outbreak, does not sell bats, it is said. But even as scientists work out the details, the fact is that we are beginning to see more zoonotic diseases—from swine flu to avian influenza. These are diseases that are getting transferred from animals to humans, triggering a pandemic.

The breaking of boundaries between animal and human habitats will lead to more such outbreaks

The fact is that so much of this virus transference is happening because of our dystopian relationship with the natural world. On the one hand, we are pushing every kind of chemical and toxin into our food. This is making food a source of disease, not just nutrition. Antibiotics are being shoved into animals and even crops—not for disease control but to make them grow more; put on weight, so that business profits. As a result, resistance to drugs needed for human survival is on the rise. On the other, we are growing our food in ways that favour disease growth—industrial farms, which are vertically integrated, are fast becoming the source of contagion. Remember the origin of swine flu from industrial hog factories in Mexico that contaminated water! This breaking of the boundaries between animal and human habitats will lead to more such outbreaks. And this, in a world that is even more inter-connected and globalised, will make the infection wildly contagious.

There is also the question of the manner in which trade works in the world. The fact is global vulnerability will increase—from disease to climate change. In the past three decades, the world has invested in building a monolith trade system, which has no local or regional control.

The risk management systems of the poor should teach us that diversification is the key to survival. The farmers of our world always minimised risk through a system of crop and livestock management. They grew a variety of crops—scientists have counted over 50 crops growing in single homesteads. They reduced dependence on the factors that they could not control, but worked on ways to build more resilient local economies. Now, I know that we cannot turn back the clock of globalisation; we cannot wish away this monster world trade system. It is profitable and it is aspirational—everybody wants to be integrated to the world supply chain. But surely, given the almost certain shocks that await us in our world, it is time we re-thought the very idea of globalisation. Let's start by working on localisation first. [DTE](#) [@sunitanar](#)



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The new coronavirus is spreading exponentially and stealthily. Then why is the world hesitating to acknowledge it as a pandemic?

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universe apart



CSR SPECIAL

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Companies can bring
meaningful changes
in society through
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10:24 AM

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AND COUNTING...

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Note: Figures for a year till December 2019

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Need to boost our antimicrobial arsenal

This is in reference to the cover story, "The magic bullet's toll" (16-31 January 2020). The chance discovery of penicillin by Alexander Fleming in 1928 and its subsequent development by Howard Walter Florey introduced a new era of medicine. Both Fleming and Florey were awarded the Nobel Prize in medicine in 1945. In his acceptance speech, Fleming raised alarm on the overuse of antibiotics: "Time may come when penicillin can be bought by anyone in the shops. Then there is the danger that the ignorant men may easily under-dose himself and by exposing his microbes to non-lethal quantities of the drug, make them resistant." The antibiotic apocalypse described in the article corroborates Fleming's apprehensions. Indeed, now we are moving backwards to the world of our grandparents where bacterial infections were often lethal because no specific treatments were available.

The natural process of evolution of resistant strains has been accelerated by the selective pressure exerted by the widespread, indiscriminate and irrational use of antimicrobial drugs. Because of the legendary resilience of microbes, the least that humans can do is to keep them at bay. In the continuing epic struggle with microbes we are in critical need for novel strategies to boost the antimicrobial arsenal. In any event, we should not forget what the evolutionary biologist Stephen Jay Gould said: "We live in the age of bacteria...as it was in the beginning, is now, and ever shall be, until the world ends."

JAYDEV JANA
KOLKATA

PHOTOGRAPH: REUTERS

Food supplements a concern

This is in reference to the cover story "Communicating diseases" (16-31 December, 2019).

Consumer awareness is very low not only in case of fast foods but also in case of diet supplements which is a soaring industry fast gaining popularity among Indians, particularly among youth. India is one of the world's youngest nations and the craze for body building is quite significant among school- and college-goers. Diet supplements like whey protein, fat cutters, glutamine and protein isolates make good sales and youngsters are fanatical about taking them, even skipping their normal meals. This is a great concern.

PRAMOD PRADHAN
VIA EMAIL

India not a climate action leader

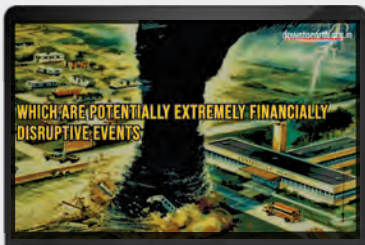
This is in reference to "Climate emergency CoP 25: India must release its 2005 baseline emissions data", published online on December 13, 2019. The article says India is a world leader in climate action. Can you please specify how? Look at the state of air, water, waste management and soil contamination, and its impact on food production and biodiversity loss in the form of ecosystems. Is India a world leader just by saying so?

RAJANI
VIA EMAIL



Deal with 'green swan'

Climate change can lead to major financially disruptive events, dubbed "green swan", which could be behind the next systemic financial crisis, says a



report by the Bank for International Settlements. Financial and climate stability are interconnected public goods, it says. However, integrating climate-risk analysis into financial stability monitoring is challenging because of varied climate change impacts and mitigation strategies.

FOR MORE VIDEOS, SCAN



Pneumonia burden of Asia, Africa

Pneumonia killed a child every 39 seconds in 2017 and half the toll of over 0.8 million deaths was in India, Nigeria, Pakistan, Democratic Republic of Congo and Ethiopia.

India's poor R&D sector

There are 6,000 people per million employed in research and development (R&D) in countries like Israel and South Korea, while in India the figure stands at just 216 people per million.

FOR MORE INFOGRAPHICS, SCAN



Sludge disposal stories heartening

This is in reference to "Treasure in excreta" (16-31 January, 2020). At a time when the country is struggling to find a solution to dispose of the faecal sludge of millions of Indians who have septic tanks, your article on the treasure in excreta and some success stories in the pilot studies are most heartening. Linking sanitation with agriculture will go a long way in ensuring safe disposal of human excreta on the one hand and improving agricultural production and ensuring food security on the other. The article was most timely. Hope state governments will take up the suggestions in the right earnest.

V GANAPATHY
VIA EMAIL

Sustainable livelihood can curb poverty

This is in reference to "How India remains poor: Has poverty become 'hereditary'" published online on January 14, 2020. Clearly, we need to generate sustainable livelihood options out of the ample natural resources in these forested and/or tribal districts—something we are consistently failing to do. Could the failure be because of flaws in the model of development that we keep following blindly, or is it deliberate?

VINAY
VIA EMAIL

➤ Implement one-child policy. Just follow Chinese policies.

PRAVEEN
VIA EMAIL

Forests being encroached upon so gradually, it's unnoticeable

This refers to "Forest panel bats for pvt plantations as compensation" published online on January 9, 2020. In most of the Himalayas, including the Shivalik Range, a lot of the so-called agricultural land would be better off under trees. In fact, most of this agricultural land was anyway earlier forestland but gradually became agricultural due to the insidious and relentless encroachments—something no politician or political party is willing to tackle. This illegal "transfer" of forestland continues unabated. It is very difficult to grasp this encroachment because it is extremely gradual and incremental, and is done on a very widespread scale in forests that have no boundaries and whose areas were measured a 100 years ago with primitive instruments. Governments are not even willing to demarcate forest boundaries using Global Positioning System and making proper, verifiable Geographic Information System (GIS) maps. Compulsory afforestation done even on twice the area diverted in degraded forests is generally untraceable after five to six years because there is neither any GIS map nor record of survival with the forest departments. After a decade or so, compulsory afforestation can be done again on the same patch, like it happens in most forest department afforestation schemes. In this way we can keep going around in circles and patting ourselves on the back with the unverifiable "State of Forest" reports, even as our forests continue to thin out and disappear.

VINAY TANDON
VIA EMAIL



Wrong to say farm suicides down

This is with reference to "More than 10,000 farmers, farm hands committed suicide in 2017" published online on January 2, 2020. I don't think there has been a decrease in farmer suicides. There is only a decrease in the number of farm sector workers which is reflected in the fall in suicides.

TARUN
VIA EMAIL

Down To Earth welcomes letters, responses and other contributions from readers. Write to Sunita Narain, Editor, Down To Earth, 41, Tughlakabad Institutional Area, New Delhi - 110062 or send email to editor@downtoearth.org.in



Migration: I am biased, for people

Posted on January 13, 2020

The article touches the right chords but unfortunately clubs illegal migrants with legal migrants and refugees. We can't paint all in one colour. We need to differentiate the circumstances of immigration. Otherwise the idea of Nation-State will cease to exist.

KEDAR KULKARNI

What an article... linking CAA with internal migration. To check internal migration numbers, the govt would be doing NPR exercise

MANISH LAKHANI

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TRAINING PROGRAMME ON TOOLS FOR MAINSTREAMING BLUE GREEN SPACES AND INFRASTRUCTURES IN CITIES



Dates: March 15-18, 2020 **Venue:** AAETI, Nimli, Rajasthan (India) **Language of Instruction:** English
Last date for registration: March 2, 2020

BACKGROUND

Cities are growing in size, space and economy. However, they face multiple challenges, emerging from an ever increasing demand for services, crumbling infra and climate change. In this context, it is imperative to mainstream strategies of Green Infrastructure (GI) with Water Sensitive Urban Design and Planning (WSUDP).

The training focuses on roll out and testing of various tools with practitioners which help in mainstreaming the concept and strategies of WSUDP and GI.

Theme 1: Concepts of GI and WSUDP

Theme 2: Tools for mainstreaming blue – green spaces and green infrastructures for making water sensitive cities

Theme 3: Knowledge Conclave on Mainstreaming GI - Experience sharing

School of Water & Waste has partnered with - University of Exeter, UK – Blue Health Project and Cooperative Research Centre for Water Sensitive Cities (CRCWSC), Australia to offer a 5-day residential training programme.

TOOLS

Urban Water Sustainability Template, Water Sensitive Cities Index, Behavioural Assessment Tool (BBAT), Environmental Assessment Tool (BEAT), and Community Level Survey (BCLS) for Blue Places for Public Health, etc.

WHO CAN APPLY?

- Architects, Planners, Engineers, Geographers and others who are involved in sustainable urban development and infrastructure planning.
- Government officials, Non-Governmental Organisation, representatives and Private Consultants
- Academic faculty, researchers and students

COURSE FEES:

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For registration and other information:
<https://www.cseindia.org/tools-for-blue-green-infra-9818>

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Digest

WHAT'S INSIDE

Uttarakhand inspires Indonesia, Nepal and Canada to plant saplings at weddings **P12**

Employees protest as tech giants tie up with climate deniers **P13**

Indonesia's top court rules against government, bars mining in a pristine patch **P13**

1,000 WORDS VIKAS CHOUDHARY



As the government has put curbs on stubble burning, several farmers of Dabwali village in Haryana have invested ₹20 lakh each in three-machine sets to manage paddy crop residue. The machines cut straw, chop them and even turn them into bundles. The farmers travel across Haryana, Rajasthan and Punjab, collect straw and sell them to dairy farms and *gaushalas* (cow sheds) as fodder for cows of native breeds.

FOR MORE PHOTOS, SCAN



Trees that bind families

INDIA HAS a culture of carrying out plantation drives and they attract huge participation. The survival rate of these plants, however, remains low as most are left uncared for. This always bothered Kalyan Singh Rawat, who is now 66 years old and lives in Dehradun, Uttarakhand. So in 1994, this biology teacher at the government intercollege in Gwaldam, Chamoli district, started the Maiti Andolan. Maiti in local language means the home of a bride's mother. Rawat's idea was simple: each bride would gift a sapling to her mother before leaving for her in-laws' house. In return, the newly-wed would get sapling of a fruit-bearing tree. Over the years, more than 500,000 plants have been sowed under the initiative and each one has been raised with love and care because of the emotional connect. This has improved water and fodder availability in the region.

"We also carry out plantation drives. In one such drive, we transformed a 10-hectare barren land into a small forest in Chamoli and named it after Gaura Devi to pay homage to the Chipko movement," he says, adding that the movement brought him close to nature.

The idea of Maiti came to him in 1982 when his wife, Manju Rawat, planted two papaya trees in the backyard just days after their wedding. The couple invested

An Uttarakhand teacher gives reasons to take care of plants after plantation drives

VARSHA SINGH

time and effort in the trees and were overwhelmed when they bore fruit. Drawing from the experience, Rawat undertook similar initiatives in nearby communities, but those were unsuccessful. In 1987, Uttarkashi witnessed a severe drought. To ensure that the parched trees were taken care of, a tree coronation ceremony was organised. A village-level tree committee was also established and the panchayat head was made its chief. That was also the time when Rawat had started sensitising students about the Maiti initiative. Soon, at a wedding, a bride gifted her mother a sapling. "The gesture affected all at the wedding and the practice became the norm in Uttarakhand. Now, most wedding cards mention Maiti as a distinct ceremony," Rawat says.

The practice has also become popular in Gujarat, Rajasthan and Himachal Pradesh. In fact, it has now gained international recognition. Some cities in Indonesia have made it mandatory for couples to plant saplings before getting their marriage registered. The initiative is successful in Nepal as well. Flora MacDonald, Canada's foreign minister in the late 1970s, met Rawat in 1999 and promised him that she would popularise the initiative in her country. This biology teacher has been awarded Padma

Shri this year and says the initiative can go a long way in increasing local climate resilience.



Tech giants clandestinely join hands with climate deniers

OVER 350 Amazon employees from across the globe have alleged that the US tech multinational is funding climate deniers for oil and gas trade. The news comes months after Amazon chief Jeff Bezos publicly announced that his company is committed to become carbon-neutral by 2040. The employees, under the Amazon Employees for Climate Justice banner, spoke

Jeff Bezos to end his hypocrisy: You cannot call your corporation a 'leader' on climate change while partnering with ExxonMobil and BP to extract more fossil fuels," tweeted US presidential candidate Bernie Sanders.

This trend of tech multinationals either downplaying or, worse, faking their climate commitments is becoming common. In November 2019, over 2,300 Google employees, under Google Workers for Action on Climate, issued a list of efforts they want the company to undertake to fight climate change. The list includes, zero emissions by 2030, zero contracts with fossil fuel firms, zero funding for climate-denying or -delaying think tanks, lobbyists and politicians, and zero collaboration with entities enabling the incarceration, surveillance, displacement, or oppression of refugees or frontline communities. Similarly, employees of Microsoft openly criticised the company's "complicity in the climate crisis" last September when it entered a partnership with oilfield services company Chevron and Schlumberger.

out after Amazon changed its external communications policy that threatens to fire employees for speaking out about climate change without proper authorisation. "They are telling



An Amazon employee speaks at a rally outside the company's shareholders meeting in May 2019

BITS

INDIA MAY soon get its first cheetah from Namibia after the Supreme Court gave the green signal. The apex court had earlier stayed such relocations stating that there was no scientific study to show that reintroduction of cheetahs and lions in Madhya Pradesh's Kuno-Palpur Wildlife Sanctuary would be successful. Cheetahs became extinct in India when the ruler of an erstwhile princely state in Koriya, Chhattisgarh, gunned down the last three Asiatic cheetahs in 1947. However, some did spot a female cheetah in 1951.



CUTTLEFISH EAT fewer crabs during the day if they know they will get shrimps, their favourite food, in the evening. Their sophisticated brain allows them to optimise their foraging activity not only to guarantee they eat enough but also to ensure they eat more of the food they prefer. A University of Cambridge report shows they quickly shift from one eating strategy to another depending upon their experience. This discovery could provide valuable insight into the evolutionary origins of such complex cognitive ability.

Court halts mining in Borneo's pristine land

AFTER A two-year legal battle, Indonesia's Supreme Court has revoked the permit to mine coal in the mountainous forests of Central Hulu Sungai regency in Borneo's South Kalimantan province. The region, with rich-biodiversity, is home to several endangered species, including critically endangered Bornean orangutan, and has so far remained untouched by coal mines and palm oil plantations. That's the reason, in 2017 when the Indonesian government granted PT Mantimin Coal Mining (MCM) a permit to operate there, it caused an uproar among residents and environmental groups and surprised

local government officials who have supported local people in their opposition to mining and plantation projects. With assistance from Walhi, Indonesia's largest environmental protection group, the residents sued MCM and the ministry of energy and mineral resources. Their line of defence was centred around the loophole related to granting of the permit, which requires the approval of local people. Activists had also delivered over a thousand handwritten letters to Indonesian President Joko Widodo calling for justice and to save the verdant mountain range.

EXPERT'S GUIDE TO RURAL DISTRESS

This year's
Budget has all
the ingredients to
deepen India's
farm crisis

JITENDRA
NEW DELHI



THESE ARE desperate times. Rural unemployment is at a 45-year high while the consumption expenditure of rural families has fallen by 9 per cent between 2011-12 and 2017-18, as per a report by the National Sample Survey Office (NSSO) that the government never released but got leaked to the media in November 2019. Between 2011-12 and 2015-16, the income of farmers grew by just 0.44 per cent a year, and has not risen since then. One way to counter a flailing economy is cash infusion. So, when Union Finance Minister Nirmala Sitharaman presented the Budget for financial year 2020-21, economists were expecting a substantial fiscal stimulus to key government initiatives, such as the Pradhan Mantri Kisan Samman Nidhi (PM-KISAN is a direct cash transfer scheme under which farmers receive income support of ₹6,000 a year) and the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS). In a media interaction in October 2019, Nobel laureate Abhijit Banerjee also suggested increase in allocation to MGNREGS to reboot the economy by boosting demand and increasing consumption in rural areas. But this did not happen.

Instead, the announcements are likely to aggravate rural distress, facilitate privatisation of the farm sector and trigger population movement from villages to cities because allocations to many crucial schemes have either gone down, remained static or risen marginally (see 'Who gains?').

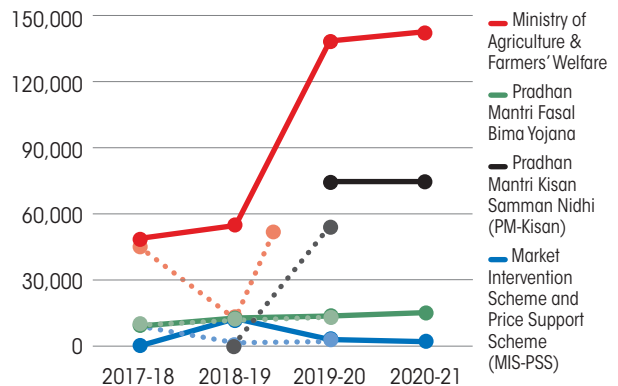
Budget allocation for PM-KISAN has been kept the same at ₹75,000 crore, while the budget for MGNREGS has gone down by ₹10,000 crore—from ₹71,002 crore (revised estimates) for 2019-20 to ₹61,500 crore in 2020-21. There are more such inexplicable announcements. The government has massively reduced the food subsidy bill—from ₹1.84 lakh crore to ₹1.15 lakh crore. This is bound to impact the purchasing capacity of the Food Corporation of India (FCI), the nodal agency that procures wheat and rice to be supplied under the public distribution system, and indirectly impact farmers whose grains will not be bought. Moreover, FCI, whose share in the food subsidy bill last year was ₹1.51 lakh crore, spent just ₹75,000 crore. This can mean two things—one, the allocation itself was inflated and the government never had the money; or two, it had the money but never

WHO GAINS?

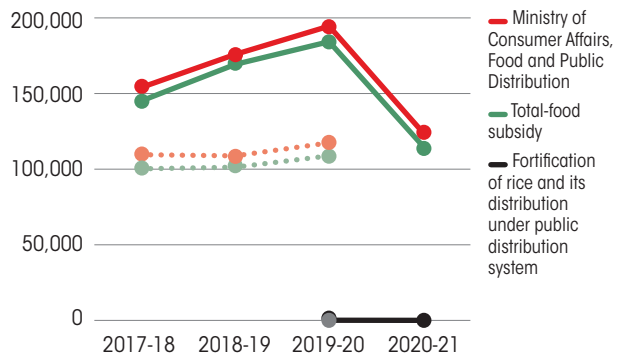
Budget 2020-21 has little to offer to rural India. In several schemes, allocation has been slashed below the revised estimates for 2019-20

— Budget ••• Revised estimates (RE) for 2019-20/actual spending for previous years
Figures in ₹cr

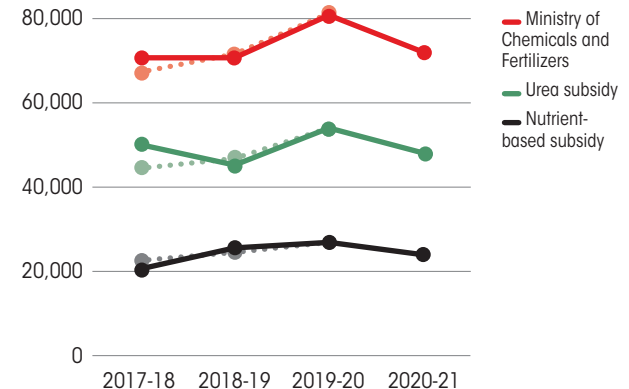
AGRICULTURE Budget allocation for minimum support price drops by 33%, goes below RE



PUBLIC DISTRIBUTION SYSTEM Food subsidy gets more than 30% budget cut



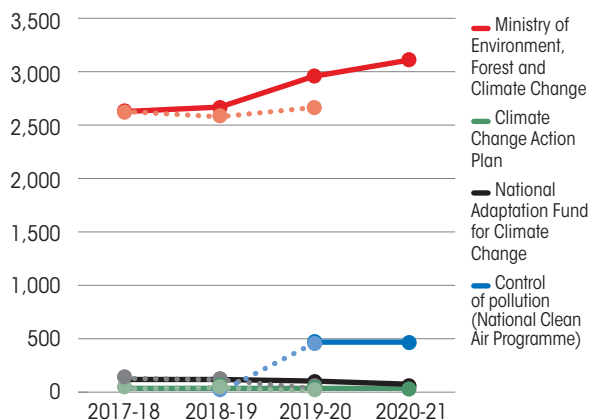
FERTILISERS Budget for urea and nutrient subsidies cut by nearly 11%



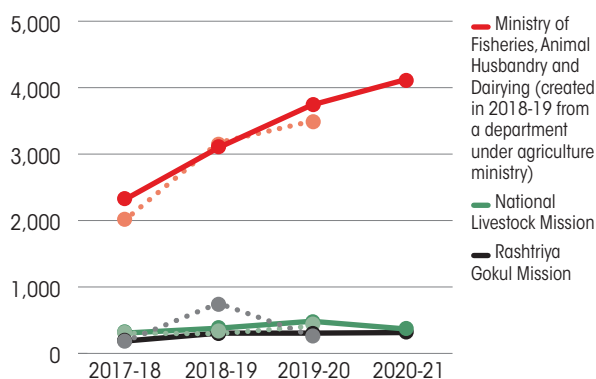
Source: Union Ministry of Finance

— Budget ... Revised estimates (RE) for 2019-20/actual spending for previous years
Figures in ₹cr

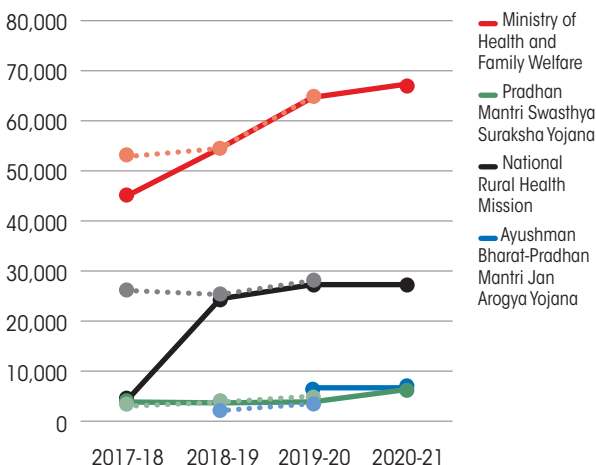
ENVIRONMENT Despite a ₹4,440 cr announcement, budget for air pollution control stagnant at ₹460 cr



CATTLE AND FISHERIES National Livestock Mission budget dops by over 20%, goes below RE



HEALTH Budget for National Rural Health Mission remains stagnant, despite rise in RE



Source: Union Ministry of Finance

intended to use it. Either scenarios did not help the rural distress last year. “Reduction of food subsidy bill in this Budget means FCI would procure less, which will adversely impact farmer income,” says Shambhu Ghatak, economist with Inclusive Media for Change Project, a Delhi-based non-profit advocacy group.

Similarly, the subsidy on fertilisers has been reduced by ₹9,534 crore—₹83,434 crore to ₹73,900 crore. This has been done ostensibly to discourage the use of chemical fertilisers and promote organic ones. But there is no corresponding rise in subsidy of organic fertilisers. “It’s plain ignorance if the government thinks organic farming does not require fertiliser,” says Devinder Sharma, a Chandigarh-based agriculture and trade policy analyst. The government has allocated a paltry ₹12.5 crore to promote the use of organic and biological sources of nutrients. “Study shows that stopping the use of chemical-based fertilisers to shift to zero-budget natural farming can reduce yield by 25 per cent to 50 per cent, which may put the country’s food security at risk,” says Ashok Gulati, Infosys chair professor at the Indian Council for Research on International Economic Relations (ICRIER), a Delhi-based think tank. “So the government needs to be cautious while moving towards zero budget or organic farming,” he adds.

The minimum support price regime has also taken a hit. The government has reduced allocations to Market Intervention Scheme and Price Support Scheme (MIS-PSS) and Pradhan Mantri Annadata Aay Sanrakshan Abhiyan (PM-AASHA). Under MIS-PSS, designated Union government agencies, such as the National Agricultural Cooperative Marketing Federation of India (NAFED), procure crops under price support schemes and work to provide adequate remuneration to farmers for their produce. The budget for PM-AASHA has been reduced to a third—from ₹1,500 crore in 2019-20 to ₹500 crore.

What exactly is the government trying to do?

GRAND DESIGN

“It seems the government wants to aggravate rural distress, if not engineer new ones. It wants to reduce the number of people working in the farm sector and trigger a population migration towards cities. That is its idea of development and urbanisation,” says Sharma. A report released by the National



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(3 सिविल एन्क्लेव तथा
3 संयुक्त उद्यम हवाई अड्डे)
International Airports
(3 Civil Enclaves &
3 Joint Venture Airports)

+

10

कस्टम हवाई अड्डे
(4 सिविल एन्क्लेव)
Custom Airports
(4 Civil Enclaves)

+

81

अन्तर्देशीय
हवाई अड्डे
Domestic Airports

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अन्य
सिविल एन्क्लेव
Other Civil Enclaves

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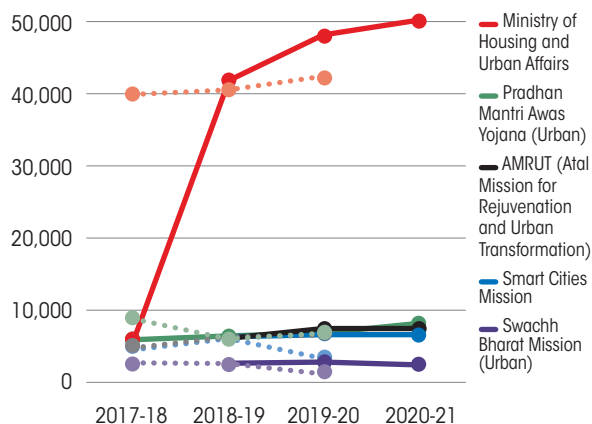
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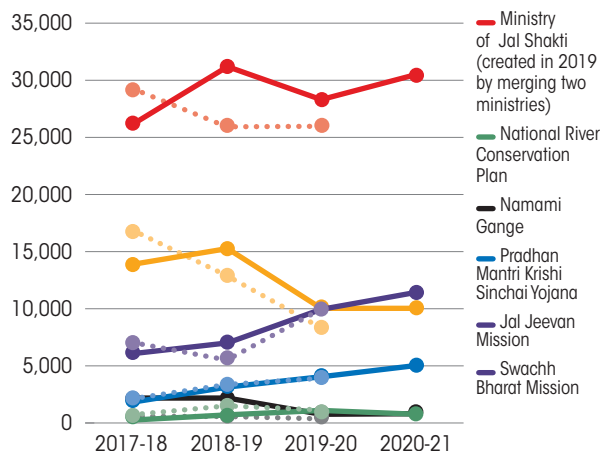
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Figures in ₹cr

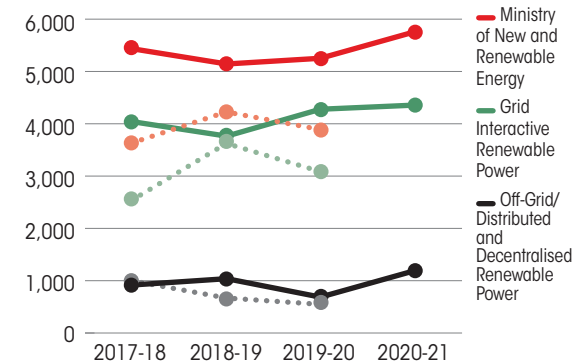
URBAN AFFAIRS Budget for smart cities sees a small cut; RE nearly 50% of 2019-20 budget



WATER AND SANITATION Budget for river conservation drops by over 30%, drops below RE



RENEWABLE ENERGY Budget for off-grid solar power goes up by over 70%



Source: Union Ministry of Finance

Skill Development Corporation in 2016 had recommended that the government should reduce the number of people involved in the farm sector from 50 per cent of India's population to 38 per cent by 2022 to double farmers' income. The government seems to be working to that end.

In its two terms, the National Democratic Alliance government has brought in three "Model" Acts that show its intent to bring in private players in the agrarian economy—the Model Agricultural Land Leasing Act, 2016; the Model Agricultural Produce and Livestock Marketing (Promotion and Facilitation) Act, 2017; and the Model Agricultural Produce and Livestock Contract Farming and Services (Promotion and Facilitation) Act, 2018. The government wants all states to adopt these Acts but so far only three—Uttar Pradesh, Uttarakhand and Maharashtra—have complied, and that too in part.

These Acts not just formalise and facilitate involvement of big companies in agriculture but tilt the playing field in their favour. For instance, the Model Agricultural Land Leasing Act, 2016, provides security to the landowner to lease out land to anyone. Agricultural laws in the country work on the presumption that the tiller is the owner of the land. For this reason, big landowners in villages have traditionally feared signing contracts with farmers who work on their lands. Most such arrangements work on trust. This Act will not only make landowners secure about their right over the land, but also encourage companies to lease large tracts and undertake initiatives for captive farming.

The second, Model Agricultural Produce and Livestock Marketing (Promotion and Facilitation) Act, 2017, ends the monopoly of state-level Agricultural Produce Marketing Committees in organising and controlling agriculture markets or *mandis*. At such markets, buyers pay a *mandi* tax, and legally no trade can happen between farmers and buyers outside such markets as that will be a tax theft. Traders have always demanded that they be allowed to buy produce anywhere as this would save them *mandi* tax and allow them to bargain. But farmers stand to lose from this.

The third, Model Agricultural Produce and Livestock Contract Farming and Services (Promotion and Facilitation) Act, 2018, formalises contract farming. It provides a legal framework to

Scholarships and Group
Discounts available

CERTIFICATE COURSE ON

SUSTAINABLE, HEALTHY AND LIVEABLE HOUSING



Warming of the environment has resulted in temperatures soaring and exposing about 65 per cent of the Indian population to its ill effects. This is aggravated by the urban heat island effect (UHIE), which is a result of diminishing green spaces, waste heat from air-conditioners (AC), polluted air, heat absorbing building materials, constricted ventilation due to dense urban fabric, among others.

Bureau of Energy Efficiency predicts that India's built-up area will increase by five times by 2030, dominated by residential use. Therefore, housing sector plays an instrumental role in shaping India's future built stock to be resilient to the effects of climate change such as heat stress in urban areas, soaring energy budget due to rising demand for cooling and flooding due to extreme rainfall among others. As India is building about 12 million units in urban areas as part of Pradhan Mantri Awas Yojana, there is a strong need to mainstream climate-appropriate development practices.

Anil Agarwal Environment Training Institute (AAETI) offers this course to familiarize participants with the ambit of current government policies and schemes, inclusive spatial planning, innovative and cost-effective environmental services, and the role building geometry and material choice plays in planning and designing climate appropriate housing.

SOME HIGHLIGHTS OF THIS PROGRAMME WILL BE:

- Affordable housing in India, demand and supply footprints
- Housing environment, urban planning and climate vulnerability issues:
 - Health risk related to rising outdoor and indoor temperatures
 - Implication to energy consumption, mobility costs and other socio-economic disadvantages
- **Housing and urban planning:** Location attractiveness index and accessibility to socio-economic infrastructure
- **Housing and mobility:** land use and transport integration and pro-poor mobility
- **Urban design impacts health and living costs:** Heat island effect and its interface with urban landscape,
- Environmental Impact assessment for housing projects
- **Conservation practices and their interface with design:** rainwater harvesting, decentralised wastewater treatment, solar rooftop etc.
- **Enabling thermal comfort for all via building geometry, layout and materials**
 - Introduction to India Cooling Action Plan 2019 and the focus on thermal comfort
 - Eco Niwas Samhita 2018 for energy conservation in residential buildings
 - Walling materials and their properties; introduction to 24 alternative materials and construction technologies for housing
 - **Building energy simulation exercise for indoor thermal comfort**
- Daylighting and its components

AAETI is an ECBC compliant sustainable, state of the art campus. Participant interaction with the campus features will enable them to understand the working of all 5 natural elements coming together and acting as a learning tool for good building design practices. The campus has utilized passive techniques and decentralized systems (waste water, building waste, renewables, water sensitive design, etc.) which the participants will be made familiar with.

Note: This course involves various modelling exercises. Participants must bring a laptop.

COURSE FEE

21,000 per participant.

Partial sponsorship and Group Discounts available. (Course fee includes tuition fee, external expert lecture sessions, training materials, Boarding and lodging, Transport from New Delhi to AAETI and back)

COURSE DURATION

March 3rd-6th, 2020

(participants will be expected to come to Delhi on 2nd)

TIMING

9:30 am to 5:30 pm

VENUE

Anil Agarwal Environment Training Institute, Nimli (near Alwar), Tijara, Rajasthan

APPLICATION DEADLINE

February 29th, 2020

TRAINING METHODOLOGY

Classroom lectures, case studies, classroom exercises, discussions and field visit

WHO CAN APPLY

Architecture, planning and engineering students, architects, academics, researchers, professionals from built sector, urban local bodies and government officials.

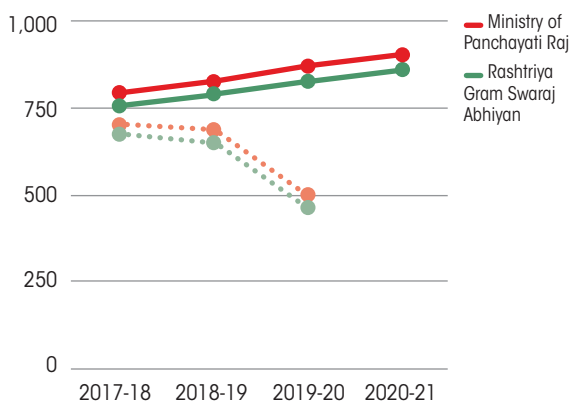


FOR DETAILS CONTACT:

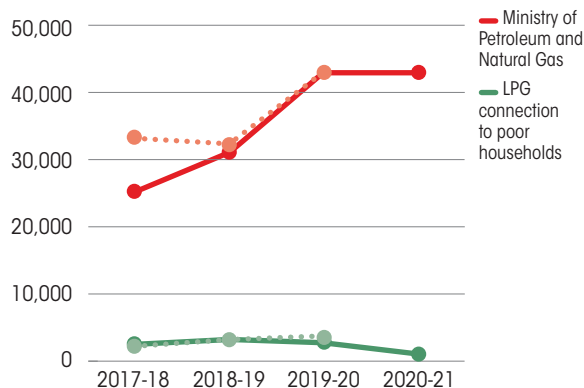
Sugest Grover, Programme Officer, Sustainable Buildings and Habitat Programme
Centre for Science and Environment, Core 6A, Fourth Floor, India Habitat Centre, Lodhi Road, New Delhi-110003
Ph: 91-011-2464 5334 / 5335 (Ext. 116)
Email: sugest.grover@cseindia.org

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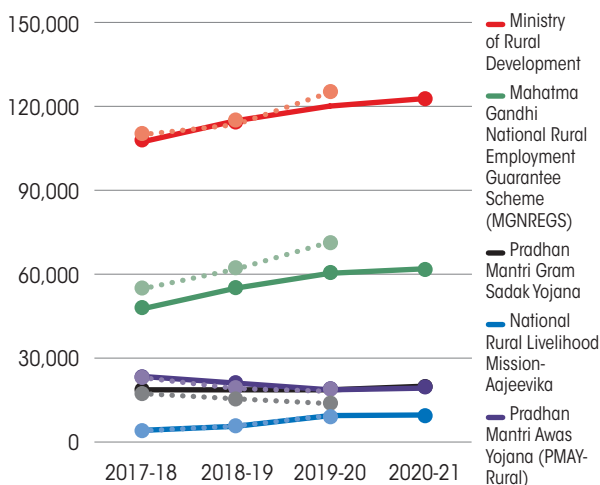
PANCHAYATI RAJ Budget for the ministry and its programme increases despite a dip in RE



COOKING FUEL Budget for LPG to poor drops by 60% even as RE is 30% more than 2019-20 budget



RURAL DEVELOPMENT Budget for MGNREGS up by 2.5% even as RE is 18% higher than 2019-20 budget



Source: Union Ministry of Finance

agricultural production (including livestock and poultry) based on a pre-harvest agreement between buyers (such as food processing units and exporters) and producers (farmers or farmer producer organisations). If there is a natural calamity and the crop is destroyed, farmers would still be obligated to honour the contract and supply crops. If the market rate of the crop goes up, the farmer would still be contract-bound to sell it at the agreed rate. Again, they are unlikely to benefit from this Act.

16-POINT AGENDA

In her budget speech, Sitharaman announced a 16-point action plan to counter rural distress. These also re-emphasised the government's intention to facilitate private players at the cost of farmers.

The government plans to set up and run warehouses and cold storages on public-private partnership (PPP) model at the block level. So far, all such government facilities were solely owned by FCI and the Central Warehousing Corporation. There are many problems with the proposed PPP model. One, private owners will prefer using these facilities to store their own produce. Two, there might be forced land acquisition for setting up the facilities.

To improve connectivity for transporting produce, the government has proposed train (Krishi Rail) and flight (Krishi Udaan) facilities. These too will aid big companies more. "Small and marginal farmers, even large farmers, will not be able to use these facilities. Companies that deal in huge volumes will use them," says Ramandeep Singh Mann, a farmer activist based in Delhi.

Fisheries is another sector in which the policies announced encourage non-fishers to enter the field. This is most evident from the minuscule ₹19 crore granted for asset creation (such as cold storages) which could be used by traditional fishers. "The government has not announced any scheme to help the traditional captive fish farming. This move to shift the traditional occupation away from fishers, and 'liberalising' farm markets is not in the interest of fishing communities, both inland and marine," says T Peter, general secretary, National Fishworkers' Forum, a trade union.

ENVIRONMENTAL BLOOPERS

The Budget talks of steps to check water depletion in 100 water stressed districts, but it does not seek to address this through environment friendly

means such as water-efficient crops. It plans to expand Kisan Urja Suraksha Evam Utthaan Mahabhiyan scheme to aid 2 million farmers set up standalone solar pumps and help another 1.5 million farmers solarise their grid-connected pumps. Under the scheme 30 per cent of the amount is given by the Centre, 30 per cent by the state and 40 per cent by the farmer, of which 30 per cent can be sourced through bank loan. "This will further increase extraction of groundwater," says Ghatak. "Farmers would show interest in producing electricity only if the government gives them better and timely payment for the electricity they supply to the grid," says Siraj Hussain, former Union agriculture secretary.

Even the allocation for rainfed area development and climate change has been reduced from ₹250 crore to ₹202 crore. Under this, farmers get financial and other kinds of support, such as cheaper seeds, to practice integrated farming system like inter-cropping and rotational cropping. These methods enhance farm returns and mitigate the impacts of drought, flood and other extreme weather events.

With climate change, extreme weather events will only rise. Though the government has increased the allocation to the Pradhan Mantri Fasal Bima Yojana—a scheme launched in 2016 to secure farmers against natural calamities and crop loss—from ₹14,000 crore in 2019-20 to ₹15,695 crore for 2020-21, it remains to be seen whether the rise will be enough. In 2018-19, the government accepted claims worth ₹19,000 crore, shows agriculture ministry data, and in the kharif season of 2019-20, the government has received ₹18,000 crore of insurance claims, as per media reports.

The Centre has also decreased the funds for adaptation and climate action. The National Adaptation Fund gets ₹80 crore while the figure in 2019-20 was ₹100 crore. "Expenditure on agriculture, livelihood and rural development should have been oriented towards mitigating risks, which include climate change. But this has not happened," says Kapil Subramanian, climate policy expert at Delhi-based non-profit Centre for Science and Environment.

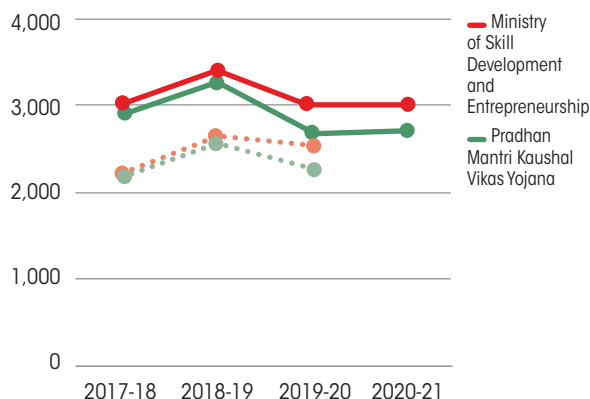
Budget 2020 seems to have all the ingredients that will force farmers to quit agriculture in droves. Is this how the government plans to counter rural distress and double farmers' income by 2022? **DTE**

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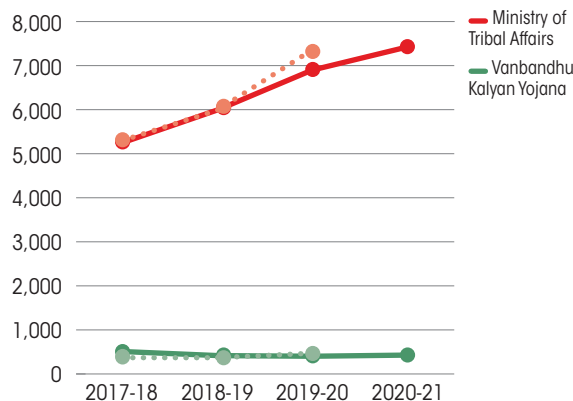
(With inputs from Akshit Sangomla and Rajit Sengupta)

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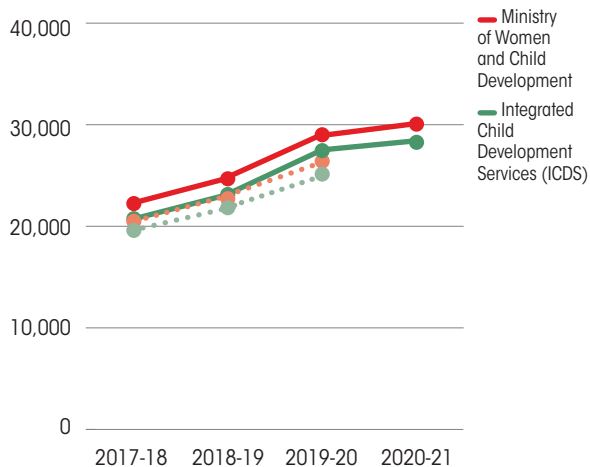
SKILL DEVELOPMENT Budget for Pradhan Mantri Kaushal Vikas goes up by nearly 2%



TRIBAL AFFAIRS Budget for Vanbandhu Kalyan Yojana up by 6% even as RE is 15% over 2019-20 budget



CHILD HEALTH Budget for ICDS up by almost 4%, which is 14% more than RE



Source: Union Ministry of Finance



DESERT BLOOM

Bringing Water to the Desert

A CSR initiative of Dabur India Limited

Dabur India Ltd is one of India's leading FMCG companies with a wide range of products based on Nature and natural ingredients. It has a manufacturing presence in Newai, a tehsil in Tonk District of Rajasthan. As part of its community development initiatives, Dabur has been rolling out programmes aimed at Environment Sustainability across the country, which includes successfully introducing cultivation of Shankpushpi herb in Barmer. Following a detailed need analysis with the community, Dabur decided to extend its community development initiative in the state and venture into Water Management and Water Conservation to help farmers in the region gain access to water all through the year.

During the year 2016-17, Dabur rolled out its maiden project on water conservation in Rajasthan. The intent was to improve the sustainable livelihood of the poorest and excluded communities in the area by strengthening their access to water and technology as well as management capacities. Through this project, Dabur sought to protect water resources in water-stressed areas, and also aim for significant water-balancing through cost-effective, eco-friendly, community-based technologies like Water Harvesting, Water Conservation, Recharging of Tube Wells and Plantation.

Three years later, it's heartening to see that this project has helped increase the water table in Newai region while ensuring round the year availability of water for farmers in 6 villages in the states despite the erratic nature of Monsoon rains.

As part of the programme, special sessions were also organised for farmers to generate awareness water conservation and management techniques and adoption of sustainable farm practices for collection and storage of rainwater. The results of this initiative were visible after the Monsoon season every year; with the village water table rising and farmers are gaining access to quality water for irrigation. Around 1200 families have directly benefited from this initiative, earning higher crop yields and better income for their produce.

For implementation of the project, the following three activities were carried out in the working area: Nadi Formation, Tanka Construction and Recharging pits (see boxes).



A traditional water-harvesting system in Rajasthan, Tanka (small tank) is an underground tank that is built in the main house or in the courtyard. The Tankas are circular holes made in the ground, lined with fine polished lime or cemented, in which rainwater is collected.

Under this project, the company decided to construct an improved version of the Tankas with labour contribution from the participating families. In all, 10 Tankas have been constructed in different villages for public use. These Tankas, having a dimension of 12 ft x 12 ft, were constructed at common places so that every

SOME OF THE KEY ACHIEVEMENTS WERE:

- Water table has risen significantly (10-20 meters)
- Nearly 3,000 cubic metres of rainwater collected and delivered to tube wells every year
- Stored water used for irrigation purpose during dry spell
- Due to recharge of tube well and improved availability of water, farmers cultivated wheat, barley and vegetables in addition to mustard
- Area under cultivation increased
- Soil salinity decreased due to availability of good quality irrigation water
- Production increased by 10-20%, resulting in ₹10,000-50,000 higher annual earnings for the farmers



NADI FORMATION



Nadis are village ponds that are used for storing water from an adjoining natural catchment during the rainy season. Nadis in Rajasthan serve the purpose of building up water reserves for human beings and their cattle. Besides, being a surface water body, they also act as a watering hole for animals.

After detailed discussion with the community, an existing nadi in Palai village was selected for rejuvenation. The nadi was in a neglected state with uneven ground level and very little water storage capacity. Dabur started the rejuvenation work on this nadi by cleaning, repairing, desilting and

deepening it with the aim of completing the nadi digging and other related activities around this pond before the onset of Monsoon. Alongside rejuvenating the nadi, its officials also conducted programmes to create awareness among the communities on water conservation and regeneration.

The 66 metre (length) x 33 metre (breadth) x 3 metre (depth) nadi now has a capacity to store around 65 lakh litres of water, enough to meet the potable as well as irrigation needs of the villagers for a year. This nadi has been providing water to three adjacent villages for irrigation as well as their drinking purposes.

household in these villages can have easy access to potable water. Each Tanka has a cemented catchment area for collection of rainwater and one hand pump for taking out water.

Each Tanka – with cement plaster, cement concrete and covered with a cemented roof – has the capacity to harvest 32,000 litres of rainwater. While the Tankas were constructed primarily for meeting domestic-water needs, families can use the tanka water for irrigating their plots. Today, 250 families are benefiting from these Tankas.

TANKA CONSTRUCTION



RECHARGING PITS



Over the past decade, scanty rainfall and long periods of dry spell have led to a drop in ground water levels in Tonk district.

Understanding the fact that tube well recharge is the best way of harvesting every possible drop of rainwater and sending it directly to the ground water table, Dabur initiated a recharging project as part of our larger Water Management & Conservation initiative in these villages. Under this project, 55 tube wells and wells across the three villages were recharged. For the purpose, cemented containers

(with a 3ft x 3ft x 3ft dimension) were constructed and 50-200 ft long pipeline set-up. During rainfall, the catchment area water flows towards these containers. Once the container was full, the water moved from these containers to the well through the pipeline, thereby recharging the well.

Additionally, a 6ft deep circular ring structure has been constructed near the existing tube wells. The containers are connected to these structures, directing the water flow to recharging these tube wells.



A skill development centre run by RP Sanjiv Goenka Group in Kolkata

Spending responsibly?

Companies can bring meaningful changes in society through the huge ₹13,624 crore corporate social responsibility funds

ISHAN KUKRETI NEW DELHI

IT WAS around 2009. Seraikela in Jharkhand's Seraikela-Kharswan district was in deep distress as 96 per cent of the deaths in the block occurred at neonatal stage. Eighty three per cent of these deaths were because of weakness due to low birth weight, pneumonia and other infections, and asphyxia due to prolonged delivery and other birth complications. To tackle this, Tata Steel Limited launched Maternal and Newborn Survival Initiative as part of its Corporate Social Responsibility (CSR). The programme brought under its fold women from 167 villages who belonged to low-

PHOTOGRAPH COURTESY: RP-SANJIV GOENKA GROUP

income families and those who did not have access to quality maternal facilities. As many as 200 workers were trained to generate awareness and to increase demand for healthcare services. These workers went from house to house collecting real-time information on the health of mothers and children on tablets provided to them. Corrective action was taken without delay. The programme helped reduce neonatal mortality up to 32.7 per cent and infant mortality up to 26.5 per cent within three years.

Such philanthropic initiatives have a long history in India. But the idea was brought into a legal framework in 2014 when CSR was introduced as a statutory obligation under Section 135 of the Companies Act, 2013. Under this, every company with an annual net worth of over ₹500 crore, turnover of over ₹1,000 crore, or net profit of over ₹5 crore, must spend at least 2 per cent of its net profit on CSR. Latest data with the Ministry of Corporate Affairs (MCA) shows expenditure on CSR activities has increased from ₹10,066 crore in 2014-15 to ₹13,624 crore in 2017-18. During this time, the number of public sector undertakings (PSU) and private sector firms also increased from 16,548 to 21,397.

These companies divert a major chunk of the CSR funds towards human development. A 2019 study by the Indian Institute of Corporate Affairs (IICA), a government think tank that provides holistic advice on issues related to corporate affairs, shows 55 per cent of the CSR funds in the country are spent on human development and social welfare. As many as 104 companies are involved in activities related to human development. These include 30 PSUs and 74 private firms. However, the focus on economic development and environment sustainable development is relatively poor, the report states. The reason for this, say experts, is the nature of these sectors.

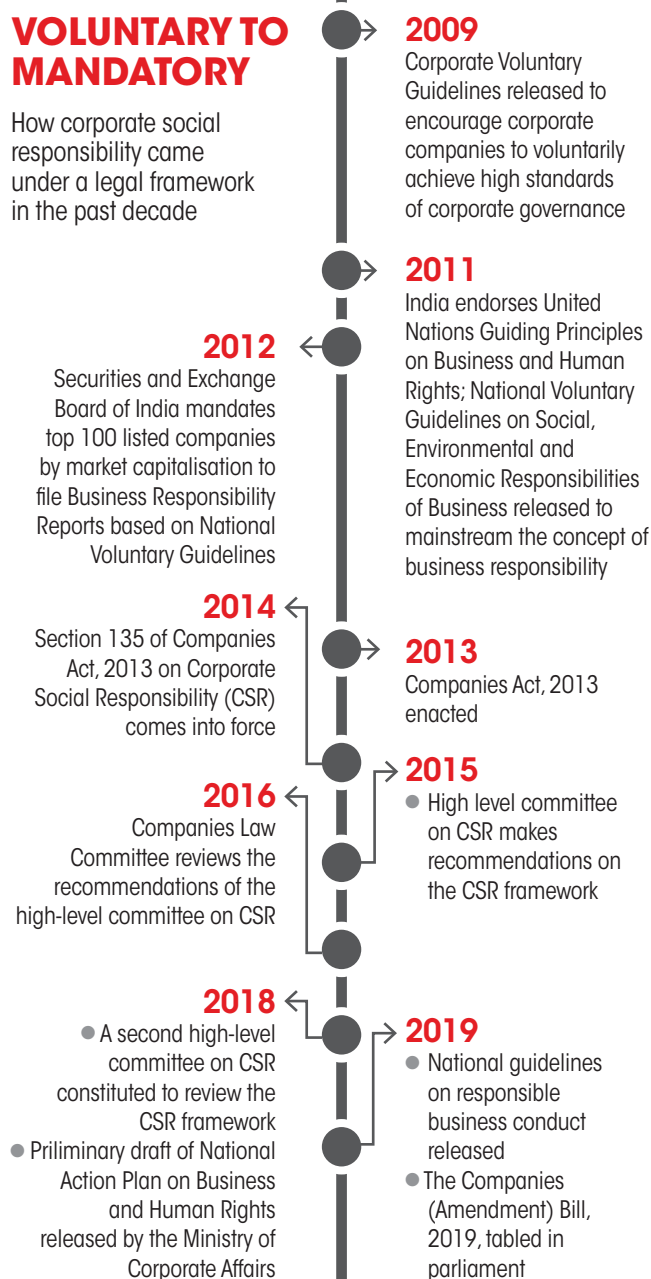
“Traditionally, sectors such as health and education have a clear blueprint and are easy to undertake. Moreover, these activities are easily quantifiable which gives companies ready numbers. But companies have not focused much on environmental activities,” says Pradip Narayanan, member, CSR Laws, Praxis, a Delhi-based non-profit.

PHILANTHROPY FROM A DISTANCE

In the initial years of the CSR Act, MCA observed that companies would execute projects far from their area of operations. As per the Act, companies should choose local areas for CSR activities, but 73 per cent companies

VOLUNTARY TO MANDATORY

How corporate social responsibility came under a legal framework in the past decade



Source: Status of Corporate Responsibility India, 2019, Praxis

were found to be engaged in areas beyond their area of operations, states the IICA report that analysed data from 2014-15 to 2017-18. Maximum expenditure is in industrialised areas, while the least developed states received least funds. The phrase “local area preference” in the Act may have been interpreted as mandatory and not directory, the report states. Considering

“LONG-TERM VISION IS A MUST”

DINESH AGARWAL is former general manager and head of the Corporate Social Responsibility (CSR) department at NTPC. He was the drafting member of Ministry of Corporate Affairs' national guidelines on responsible business conduct. He speaks to *Down To Earth* on what improvements can be brought about in the sector

What are the biggest achievements and challenges of CSR?

The biggest achievement is that CSR has created a level playing field among companies. The provisions of the Companies Act, 2013, has ensured that CSR activities involve the board of the company. This guarantees that even the senior-most company official has a clear understanding on CSR. The biggest challenge is that CSR is not fully integrated into the corporate philosophy yet. It is still seen as additional activities that focus on expenditure and not on the projects undertaken.

Why has CSR expenditure been more on human development and social welfare schemes?

There are many companies that want quick mileage from CSR projects. This is possible by focusing on human development and social welfare. The companies also use these CSR investments to buy peace from the project-affected people. The idea of CSR is that companies should have a clear reason for undertaking a particular project, based on their core competencies, but that is rarely done.

There should be long-term vision on CSR projects based on principles such as sustainable development. But companies don't have it. And, as long as they don't have a vision, they will continue to have ad-hoc approach towards CSR.

Government reports have found that geographical distribution of CSR spending is skewed and places like aspirational districts are left behind.

The real question is what does the government think CSR is, and what do corporates understand it as. The responsibility of CSR project is towards the stakeholders, those who live near the area of operations of companies.

Now, the category of aspirational district has been created by the government based on the development level of a particular district. It has nothing to do with the operations of a corporate. So if aspirational districts are far from the area of operation of a corporate, it does not make sense for it to invest there. The corporate's responsibility is towards stakeholders in the area of its operations.



However, if an aspirational district is near the area of operation of a company, then it can be incorporated in CSR activities using a long-term plan for the district.

Most companies have undertaken CSR projects, but some lack scalability or the ability to replicate. This points to the fact that companies are committed towards CSR.

I would blame the government for this. It never asks companies about their long-term visions. All companies have their corporate vision for at least five to 10 years. But when it comes to CSR there is no such vision. And the government does not demand it. The government has kept parameters such as scalability and the ability to replicate a CSR project in considering a company's project for the CSR award. However, there is no award for projects that have actually been scaled up or replicated. With this approach, there is a big gap between the cup and the lip.

Between 2015-16 and 2017-18, the number of companies that undertook CSR activities increased, but the amount spent on it dipped. In 2015-16, as many as 18,290 companies spent ₹14,517 crore, while 21,397 companies spent ₹13,624 crore in 2017-18. Why did this happen?

This can be due to several reasons. The most probable one is that CSR expenditure is stipulated at 2 per cent of a company's net profit, but firms are not making profits nowadays. It is also possible that firms did not find good CSR project to invest in.

this, MCA issued a directive in 2018 for all companies to follow the law in letter and spirit.

State-wise analysis of expenditure reveals low concentration of CSR activities in poor states. Jharkhand, Bihar, Chhattisgarh, Madhya Pradesh and Uttar Pradesh received only 9 per cent of the total expenditure from 2014-15 to 2017-18.

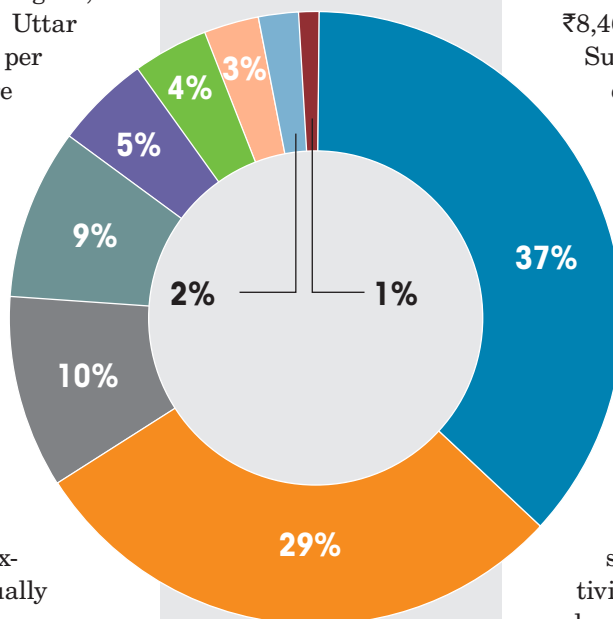
These states account for more than 55 per cent of the 117 aspirational districts identified by NITI Aayog. However, Maharashtra, Karnataka, Andhra Pradesh, Gujarat, Tamil Nadu and Delhi, which account for only 11 per cent of the aspirational districts, received 40 per cent of the total expenditure. "Companies usually undertake CSR activities in areas where work can be done without any hardship. This may be the reason that aspirational districts, with their poor infrastructure and development level, are not in the focus of companies," says Narayanan.

Further, aspirational districts are not aware of corporates' responsibility towards them, says Gayatri Subramaniam, director, Association of Women in Business, a Delhi-based non-profit. "NITI Aayog has directed only PSUs to spend in these districts," she says.

CSR activities are similarly scarce in the Northeast. An MCA assessment identifies infrastructural gaps here in basic minimum services such as rail, road, water and air connectivity. However, data shows a tiny portion of the funds was spent in the Northeast between 2014-15 and 2017-18. Among the states here, Assam spent the maxi-

How funds flow

Human development, social welfare get a big bite from the CSR pie, environment is left with a small share



- Education, differently abled, livelihood generation
- Health, eradicating hunger, poverty and malnutrition, safe drinking water, sanitation
- Rural development
- Environment, animal welfare, conservation of resources
- Nature of projects not mentioned
- Prime Minister's National Relief Fund, any other government fund
- Gender equality, women empowerment, old age homes, reducing inequalities
- Heritage art and culture
- Encouraging sports

Source: Ministry of Corporate Affairs

mum with ₹653.19 crore. While Manipur spent ₹24.78 crore and Meghalaya ₹24.11, Tripura, Nagaland and Mizoram spent as low as ₹5.88 crore, ₹3.35 crore and ₹2.41 crore respectively. On the other hand, Maharashtra spent a huge ₹8,468.28 crore during the period.

Subramaniam says, "There is not enough corporate presence in these states. This could be a reason for the poor expenditure here. It is also possible that corporates are unwilling to invest here because some areas are inaccessible and lack strong implementation agencies," she says.

What's more, five years after the Act was enforced, 70 per cent of the companies still do not have a strategy to implement CSR activities. As per the law, companies should set up board level committees, which draw plans for the effective implementation of their projects. According to the IICA study, if a firm has a CSR policy and committee in place, but does not have an implementation strategy, supports the conclusion that companies are more focused on complying with the law and spending CSR funds rather than making a serious initiative. Such a behaviour, says the study, could be due to lack of capacity or experience in the development sector.

CSR has a huge potential to improve the lives of a large number of people in the country. It's ₹13,624 crore corpus can bring change in a wide variety of sectors. Therefore, it is crucial that companies do not relegate it as a perfunctory exercise, but make a meaningful contribution to society. **DTE**

[@down2earthindia](#)

**CHALLENGE 1**New Vehicle Zero CO₂
Emissions Challenge**CHALLENGE 2**Life Cycle Zero CO₂
Emissions Challenge**CHALLENGE 3**Plant Zero CO₂
Emissions Challenge

TOYOTA ENVIRONMENTAL CHALLENGE 2050

**CHALLENGE 4**Challenge of Minimizing and
Optimizing Water Usage**CHALLENGE 5**Challenge of Establishing a
Recycling-based Society and Systems**CHALLENGE 6**Challenge of Establishing a Future
Society in Harmony with Nature
 Challenge of Achieving Zero CO₂

Net Positive Impact Challenge

Toyota Devised its long term environmental vision in 2015, Toyota Environment Challenge 2050, aiming to address the critical issues that the globe will face in the days to come. The vision is a set of six challenges, three of which focuses on reducing the CO₂ emissions to zero from vehicle, manufacturing and throughout the life cycle and the remaining three focuses on having positive impact on environment by conserving water, establishing circular economy and conserving the biodiversity.

The sixth environment challenge aims in "Establishing the society in harmony with nature". To realize the same, three clear programs have been developed to achieve the same. Toyota Green Wave, Today for Tomorrow and Education for Sustainable Development programs have been designed to ensure the conservation of biodiversity and developing the eco-minds that will take care of the sustainable development in the future.

Toyota Kirloskar Motor, Indian subsidiary of Toyota Motor Corporation Japan, aligned its program in line with the global vision and came up with various interventions to enhance eco-consciousness among the school children.

TOYOTA ECOZONE

At the inception of the Education for Sustainable Development programs, TKM developed "Green Me" project through which 35 Government Schools in the Ramanagur District were selected to introduce activity based environmental learning curriculum. The detailed study of the curriculum in the schools gave the insight on the requirement for the experience-based learning center to effectively inculcate eco-consciousness among the citizens of the future.

In 2018, TKM opened the gates to our most ambitious and impactful project – the EcoZone – an experiential learning center spread over 17 theme parks across 25 acres at our manufacturing plant in Bidadi, Bangalore.

Learning at Ecozone:

Eco Zone is designed to sensitize people and inspire change through a 4-tier structure:

- Experience the Problem ■ Understand its cause ■ Create Solutions
- Experiment to implement



THEME PARKS AT ECOZONE



VALUE THEME PARK: Value zone enables the student to understand the perils of unscrupulous dumping of waste, impact of plastics on the biodiversity while including solutions, technologies & the importance of 5R (Refuse, reuse, reduce, recycle & retrieve) on a real time basis.



SILENT GARDEN: This unique landscape helps children appreciate the value of silence and its impacts on humans and biodiversity.



RAINWATER HARVESTING POND: Has capacity of 26,000 m³. The importance of harvesting rainwater and its usage is stressed.



WETLAND THEME PARK: Water is an elixir to life. Wetlands are zones that play an important role is purifying water, habitat for birds and various species and acting as flood plains while in need. The

impact of water pollution and need for conservation of wetlands are the topics of discussion at this theme park.



EDUCATION BUILDING: Is a earthen building built with locally available materials. Facility is used to engage students in activities, discussions & science-based games.



EVOLUTION TIMELINE: Quite unbelievably it has taken 4 billion years to make earth inhabitable! A timeline tour laced with murals of major flora and fauna evolution and extinction gateways.



SOLAR PARK: Ecozone is a self sustainable landscape with inbuilt ground mounted solar of 0.5 MW capacity.



CLIMATE CHANGE THEME PARK: Impact zone where one can experience the greenhouse effect and desertification. The future of earth if the misuse of earth continuous in the same phase.



ecosystem services to humans.

POLLINATION GARDEN:

The chemical free pollination meadows harbor the native pollinators ranging from birds, bees, butterflies etc. which play a vital role in the food web while offering



VEGETABLE GARDEN & ORGANIC FARMING:

Sustainable agricultural practices, cultivating your own food using simple techniques are emphasized in this zone.



ORCHARDS & MEDICINAL GARDEN:

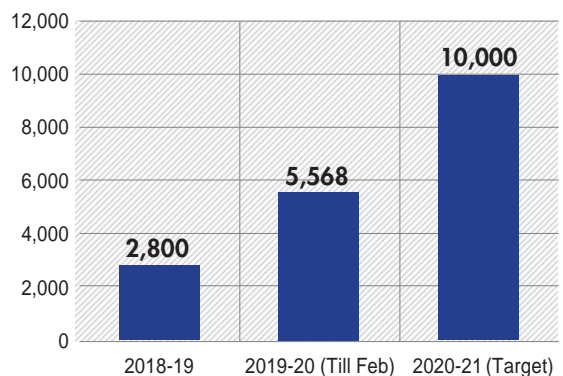
The age-old practice of Ayurveda is reintroduced in this zone. Students learn on concepts of home remedies for their common illness. The learning enables children to go back to schools to establish native medicinal gardens, vitamin gardens etc.



INDIA DEMONSTRATION CENTRE:

The India Demonstration Project showcases the evolution of green mobility solutions.

STUDENTS TRAINED AT ECOZONE



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9886807335

A large crowd of people wearing face masks in a city street, with a large red 'PAN!' text overlay.

PAN!

CORONAVIRUS

More than a month after the first case was reported from China, there is little the world knows about the new coronavirus. The strain remains a mystery, its symptoms deceptively similar to common cold and there are no curative or preventive vaccine or medicine. What's certain is that the virus is highly contagious. In just 45 days, it has killed over 1,000 people in China and infected more than 40,000 in 27 countries. Worryingly, we have not yet seen the peak of the spread. Is the world ready to face a pandemic?

A report by **Banjot Kaur** and
Alok Gupta

People queue up
to buy masks in
Hong Kong



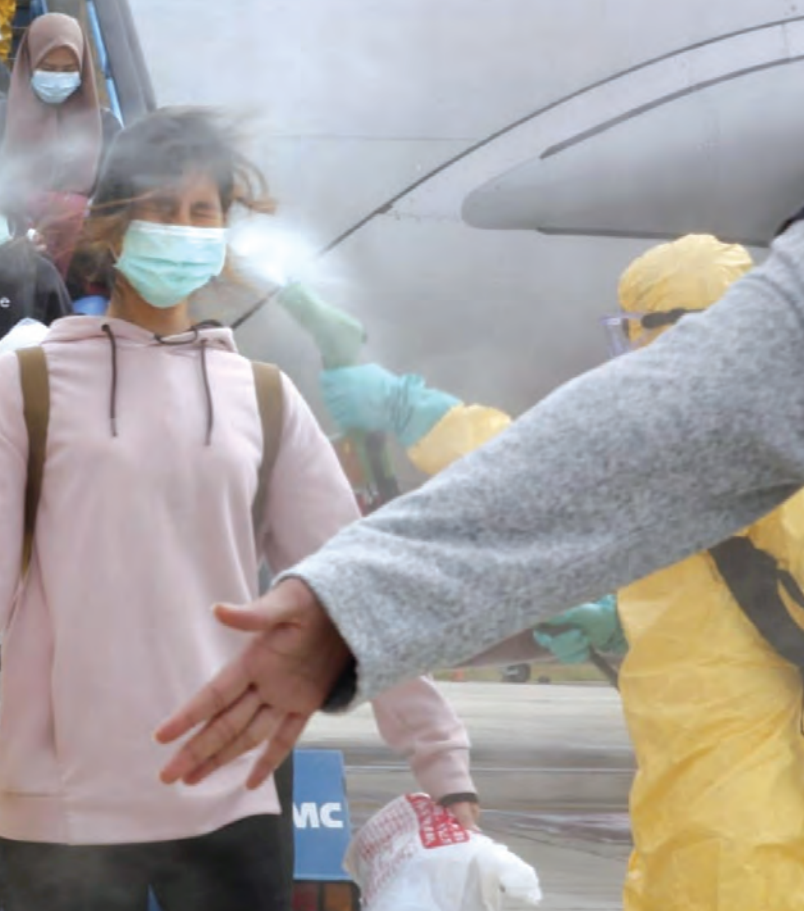
THE LUNAR New Year break has been uncomfortably long and quiet for almost 50 million people in China. Since January 23, the authorities have locked down some 13 cities, including Wuhan in the province of Hubei, which is the epicentre of the deadly coronavirus outbreak. Public transport and ride-hailing services have been suspended in this city of 11 million people. Trains and flights from the city have been suspended and people have been asked to leave their houses only for essential reasons like stocking up food. At places, the police has employed drones to ensure that people stay indoors. Travel restrictions and quarantine measures have also left streets, parks and shopping centres deserted in a dozen other cities, including Chibi, Zhejiang, Huangshi, Xiantao, Enshi, Qianjiang and Xianning. The country's largest metropolis, Shanghai, resembles a ghost city. As many criticise the government's draconian enforcement of epidemic control laws, the government says the measures are to contain the spread of the virus that poses a "grave threat" as there is no preventive vaccine or cure for it.

But if only travel restrictions and lockdowns could stop this virus. A week later, the School of Public Health at University of Hong Kong, published a paper in *The Lancet* which said infections may have spilled over to other cities even before the lockdown happened and "the epidemics are already growing exponentially in multiple major cities of China with a lag time behind the Wuhan outbreak of about 1-2 weeks". "Travel restrictions and lockdowns often only delay transmission, not stop it. Transmission is occurring as expected for a respiratory disease that is contagious in very dense urban areas," says Nathan Grubaugh, a virologist at the Yale School of Public Health, USA. As of February 10, the new coronavirus—named COVID-19 by the World Health Organization (WHO) almost one-and-a-half month after the virus was first identified—had infected 42,638 people and killed 1,018 in 27 countries. Most of them are in China. On February 10, Hubei



reported 103 deaths in 24 hours.

The toll could further rise as at present, 3,000-4,000 new cases are being confirmed every day. "Some of these cases are likely a backlog in testing and the daily case reports may present onsets that happened weeks ago," says Grubaugh. There are other reasons, too. The symptoms are deceptively similar to common cold—the classical symptoms include fever, cough and fatigue. In some people, the virus can remain asymptomatic for up to 14 days and thereby, spread stealthily. Besides, Chinese authorities have been notorious for keeping information under wraps. Consider this. A mathematical model developed by the Johns Hopkins University, USA, to gauge the spread of the virus, estimates that 58,000 people would have been affected in China by January 31. Though government data puts the figure at 11,791, it is difficult to believe given the government's track record. On December 30, 2019, Li Wenliang, a doctor in Wuhan, is believed to have first disclosed about the virus to his medical school alumni group on the popular Chinese messaging app *WeChat*. The same day, the city's municipal health commission infor-



med medical institutions about the patients but warned them not to release treatment information to public. Though on December 31, Wuhan's health authorities announced the outbreak and alerted WHO, Li was reprimanded by the police for "spreading rumours online" and "severely disrupting social order". The whistleblower succumbed to COVID-19 a week later.

NEW BUT FAMILIAR ENEMY

The virus is not entirely new to scientists. It belongs to a large family of viruses that have taken the world by storm earlier. In November 2002, a strain of coronavirus, named the Severe Acute Respiratory Syndrome (SARS), was first isolated from patients in southern China suffering from pneumonia-like symptoms. Then too, China had kept the illness a secret for months. SARS travelled across 24 countries, killing 800 people and infecting another 8,000 before it was contained in July 2003. Almost a decade later, another strain of coronavirus caused the Middle East Respiratory Syndrome (MERS) in Saudi Arabia. It spread to 27 countries killing 912 people and infecting 2,400 before being contained in 2014. But

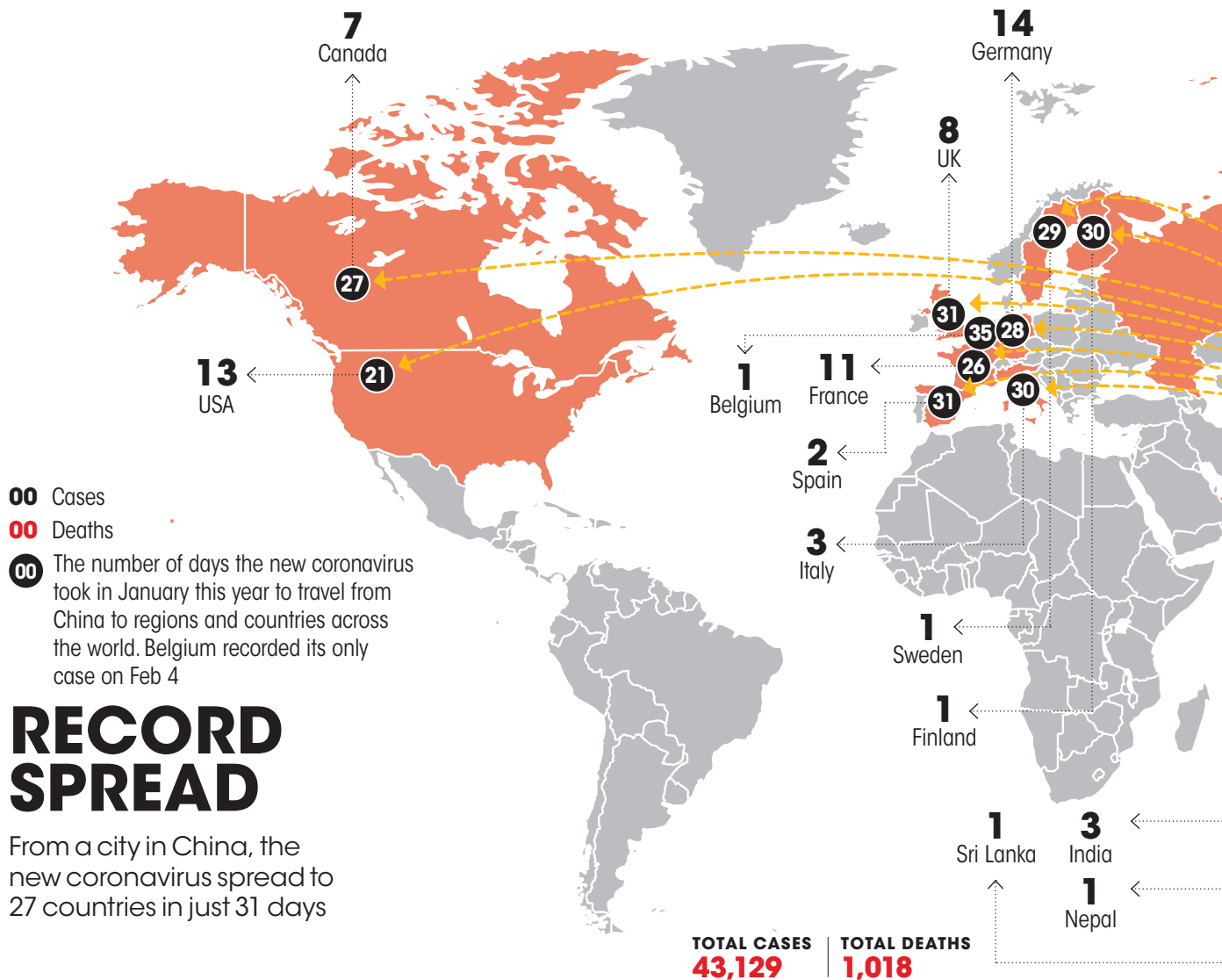
^
People in
Indonesia
being sprayed
with an
antiseptic after
they arrived
from Wuhan,
China, where
the virus
originated

COVID-19 has caused global mayhem in just 31 days (see 'Record spread' on p34).

So far, epidemiologists have managed to prepare a preliminary estimation of the epidemic potential of COVID-19 and say the basic reproduction number, or R_0 , of COVID-19 is 2.6. This means a person infected with COVID-19 can infect 2.6 more susceptible people. In comparison, SARS had an R_0 of 2; MERS had 1. But as more and more studies pour in—some 50 scientific studies have been published on COVID-19 in just 20 days of the outbreak—the value appears to exceed WHO's estimate that ranged between 1.4 and 2.5. A study published in journal *medRxiv* on January 29, in fact, estimates that the R_0 for COVID-19 could climb up to 4.08.

A probable reason for this exponential spread is a highly interconnected world (see 'How the virus spread' on p35). A lot has changed since last major outbreaks of SARS and MERS. Today it takes less than 36 hours for one to travel to any part of the world. Consider Hubei. Its mobility is unmatched—it has a robust rail and bus service and waterways systems. Air travel connects it to 55 cities within the country and 23 international cities. Wuhan alone hosts 23 universities and colleges that attract students from across the globe. Since travel ensures the virus a smooth transmission from person to person, Lunar Year festivities enabled it to spread faster.

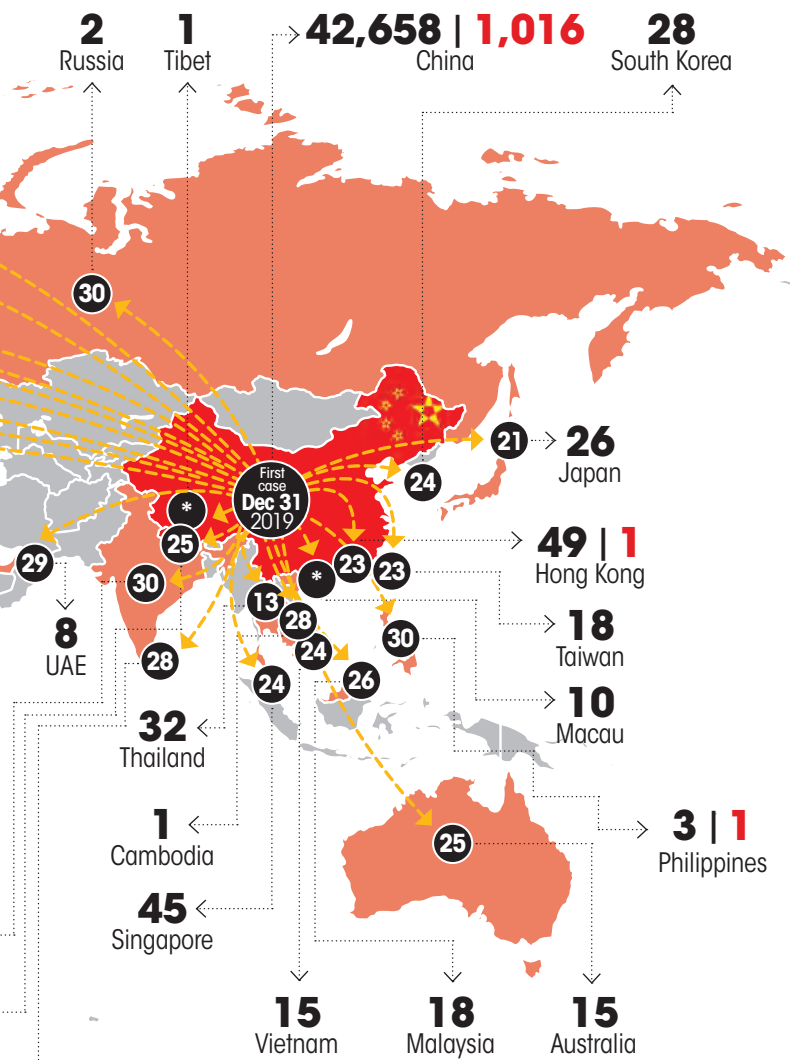
Scientists and health workers are racing against time to contain its spread. But they are yet to decipher the nature of the virus. "The global medical fraternity is 'shadow boxing' as the basics are still unknown," says WHO director general Tedros Adhanom Ghebreyesus. So far, the Chinese authorities identified the source of COVID-19 to the Hunan seafood market, where game meat, including live foxes, crocodiles, wolf puppies, porcupines and camel meat are sold. This market could have provided vital clues and helped researchers identify the real source of the virus. But the local authorities quickly cleaned the market and shut it down.



“Municipalities should have included a few scientists in their team,” says Xiaowei Jiang of the Xi’an Jiaotong-Liverpool University, China. In fact, scientists who have studied genome sequence of the virus—isolated from blood samples of the initial 41 patients who contracted the virus—say bats could be the host of the virus. On February 7, state news agency Xinhua published a study by South China Agricultural University that says genome sequences of viruses in pangolins is 99 per cent identical to those on coronavirus patients. The study thus suggests that pangolins could be the intermediate host for COVID-19. However, researchers are still uncertain on both these counts. They also cannot decipher how the virus will mutate.

RESPONSE ASSESSMENT

China has built a 1,000-bed hospital in record 10 days, which is a first-of-its-kind intervention in any past outbreak. The government has also announced a financial package of 1 billion Yuan (US \$143 million) to Hubei to deal with the crisis. China manufactures 20 million face masks per day; it is now trying to scale up production. However, the magnitude of the outbreak is testing China’s health infrastructure. When the crisis began to explode, the region was hit by shortage of testing kits, medicines, masks and hand sanitisers. “There’s severe shortage of medical supplies not just in Wuhan but also in surrounding cities,” says Wang Xiaodong, governor of Hubei. Other countries too have pressed the panic button or are struggling to



Note: figures as of January 11, 2020. *Information not available.
Source: Johns Hopkins University, USA | Graphics: Sanjit / CSE

HOW THE VIRUS SPREAD

Dec 31, 2019
New coronavirus
affects humans
exposed to
animals

Bats



Unknown animals

Humans exposed
to animals



Jan 21, 2020
Virus spreads
from infected
humans to
humans without
animal contact

Humans exposed
to animals



Humans
without animal
contact

Feb 01, 2020

Humans without exposure to animals
also start transmitting the virus

Infected humans



Rapid spread due to mobile population



implement containment measures. Russia and Singapore have shut borders with China. The US and Australia have imposed travel restrictions. Many others have moved towards imposing partial bans. As far as India is concerned, it has cancelled visas of all those travelling from China, except for Indians, and has advised its citizens not visit China for now. There is no safety protocol, but the advisory has been taken on the basis of assessment of the pathogen's virulence, says a health ministry official.

About 650 Indians have been evacuated from Wuhan and kept at quarantine centres. Three patients, diagnosed positive for COVID-19 in Kerala, had returned from Wuhan. As of February 7, as many 1,275 flights coming from China, Hong Kong and Thailand covering 0.13 million passengers

had been screened. In all this, the Union ministry of AYUSH stunned the world saying certain homeopathic and ayurvedic medicines could prevent the infection. "This was a irresponsible statement," says Asokan KV, secretary of Indian Medical Association.

Chinese scientists at the Wuhan Institute of Virology say they are testing antiviral drugs, which can suppress the activity of the virus, and not necessarily kill it. This drug will soon enter the human trial phase. Globally, various groups of scientists are working to develop a vaccine. However, it may not be easy. Scientists have still not found a vaccine for either SARS or MERS. Though there has been a pathological optimism about fast development for a weapon against this new, but familiar enemy.

TURN TO P38 ►►



Aditya Birla Group: Making a life changing difference

We work in 7000 villages. Reach out to 9 million people. A glimpse:

HEALTHCARE

Over 100 million Polio vaccinations

5,000 Medical camps / 20 Hospitals: 1 million patients treated

Over 50 deaf and mute children moved from the world of silence to the sound of music through the cochlear implant

Reach out to over 4,000 children. Extending financial support for the chemotherapy sessions.

Encouraging them in a holistic manner to get back quickly on the road to recovery.

Engaged in prevention of cervical cancer through the administration of the HR-HPV vaccines in Maharashtra.

Over 1800 girls have been vaccinated.

More than 6,600 persons had their vision restored through the Vision Foundation of India

100,000 persons tested on 32 health parameters through HealthCubed

EDUCATION

Our 56 schools accord quality education to 46,500 students

Mid-day meals provided to 74,000 children

Solar lamps given to 4.5 lakh children in the hinterland

Foster the cause of the girl child through 40 Kasturba Gandhi Balika Vidyalayas

SUSTAINABLE LIVELIHOODS

100,000 people trained in skill sets

45,000 women empowered through 4500 SHGs

200,000 farmers on board our agro-based training projects

And much more is being done through the Aditya Birla Centre for Community Initiatives and Rural Development, spearheaded by Mrs. Rajashree Birla.

Because we care.

**NUMBERS MEAN A LOT
BUT A SMILE MEANS EVERYTHING!**



ADITYA BIRLA GROUP

Engage. Uplift. Empower



Influenza victims crowd into an emergency hospital near Fort Riley, Kansas, US, in 1918 during the Spanish flu, the first pandemic in recorded history that lasted two years

Are we prepared for a pandemic?

No. The world has not even made a start

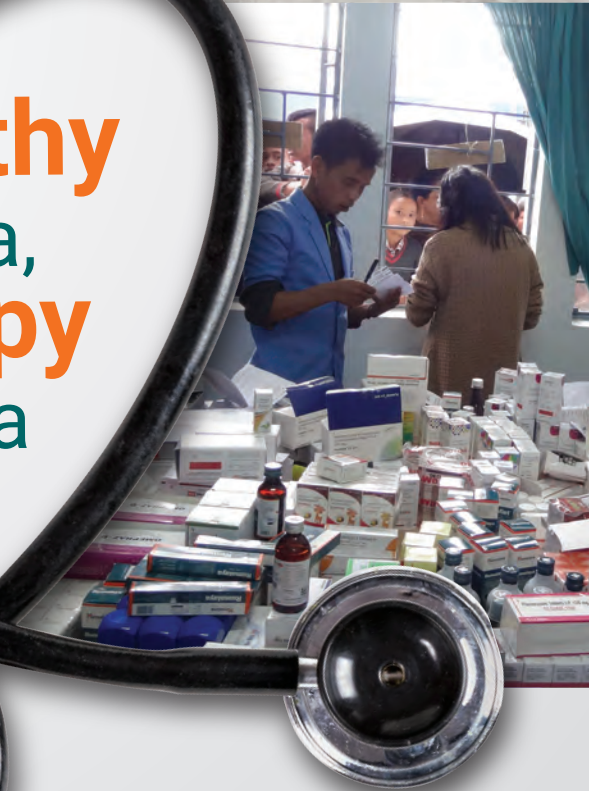
A pandemic is an epidemic occurring worldwide, or over a wide area, crossing international boundaries and usually affecting a large number of people,” says a World Health Organization (WHO) bulletin. The COVID-19 has already spread to 27 countries and infected over 40,000 people. The past four pandemics were caused by the influenza (flu) virus, therefore the medical discourse has so far been only on flu pandemics. For the past two years, WHO has been listing pandemic as an important health challenge. “A pandemic of a new, highly infectious,

airborne virus—most likely a strain of influenza—to which most people lack immunity, is inevitable. It is not a matter of “if” another pandemic will strike, but “when” it will strike,” WHO said this year.

While WHO had warned of an impending flu pandemic, nobody expected a new coronavirus to strike first, and in such magnitude. Earlier outbreaks—SARS in 2003 and the Middle East Respiratory Syndrome (MERS) in 2012—were also caused by coronaviruses, but were not declared pandemics. Even during the last pandemic in 2009 due to swine flu, the



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.

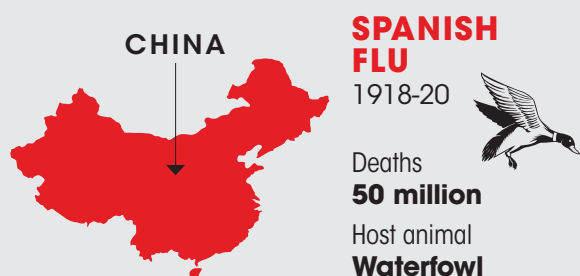
Our recent camp in Mawphlang village, East Khasi Hills, in association with SYNJUK (Ka Synjuk Ki Hima Arliang Wah Uiam Mawphlang Welfare Society), gave the local community access to specialized healthcare services, such as Dental, Ophthalmology, Gynecology, Pediatrics, Orthopedics, and General screening. 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 40 government schools in Bengaluru.

reproduction number (R_0)—infected people transferring infection to other affecting others—was 1.3-1.8; for COVID-19, it is 2.6. The fact that the outbreak is assuming pandemic proportions has been established in a research paper published in *medRxiv* by three researchers from health institutes in Glasgow and Lancaster in the UK and Florida in the US. They state that the total number of cases just within Wuhan, the epicentre of the outbreak, would be greater than 190,000. (See 'Peak season for...' on p42.)

HISTORY OF PANDEMICS

All the four pandemics the world has seen so far were zoonotic diseases



ASIAN FLU

1957-58

Deaths
1.5 million

Host animal
Pig

HONG KONG FLU

1968-70

Deaths
2 million

Host animal
Pig



ARRIVAL OF THE ZOONOTIC

Though we do not know when and where the next pandemic will surface, we do know how it will emerge. “The next pandemic will be a zoonotic disease,” Jonathan Epstein, vice-president of Science and Outreach at EcoHealth Alliance, a science-based non-profit in New York, told *Down To Earth*. Zoonotic diseases are caused by infections that spread from animals to humans. EcoHealth Alliance says waterfowls will host the flu pandemic, while bats and rodents would be the source for a coronavirus pandemic.

“Over the last 15 years, we’ve found dozens of novel SARS-related coronaviruses in bats in China and other parts of the world. Our research has shown that people in China hunt bats that are known to carry viruses linked to SARS and novel coronavirus. Those exposed to these host animals earlier have developed antibodies against these viruses, which means they’ve been exposed to them and can spread the disease,” says Epstein.

It is not a coincidence that China is the country of origin of three of last four pandemics. “While we can’t predict from where the next influenza pandemic is going to emerge, there are certain places that need particular attention. And, China is the place of all of them,” said Dennis Carrol, former director of emerging threats division of United States Agency for International Development, in a Netflix series, *Pandemic* (see 'History of pandemics').

After the outbreak, China imposed a temporary ban on wildlife trade across the country. “What we need is not a temporary ban, but permanent regulations for wildlife trade in China. What is not required is the elimination of wildlife. We need to adjust the way we do things so that we safely live alongside wildlife by limiting opportunity for outbreaks to occur,” Epstein suggested. The World Wide Fund for Nature has issued a similar statement.

Though no direct has been established between COVID-19 outbreak and climate

change, but studies say warming temperatures and melting of ice are exposing new viruses to the ecosystem. For instance, researchers recently found 33 viruses trapped in the Tibetan glacier. Out of these, 28 were completely new to science and all of them had the potential to cause an outbreak. The study was published in *bioRxiv* on January 7, 2020. As ice melts, viruses are being released in the air, which would travel through rivers and streams, infecting humans. Also, as the world is urbanising at a rapid pace, natural habitats are being destroyed. This has further exposed us to a host of new viruses for which we have no immunity.

So how many people will be affected in a future pandemic? “The 1918 global influenza pandemic sickened one-third of the world’s population and killed as many as 50 million people—2.8 per cent. If a similar contagion occurred today with a population four times larger and travel time anywhere in the world less than 36 hours, 50-80 million people could perish,” WHO warned in a 2019 report.

On any given day, more than 10,000 flights operate globally, and this explains how inter-connectivity will accelerate this spread. “During the Ebola epidemic in 2014, models estimate that without travel restrictions, 7.17 infected passengers per month would have departed from highly-affected countries like Liberia, Sierra Leone and Guinea to various destinations around the globe,” say Pierrot Derjany and his colleagues from Embry Riddle Aeronautical University, USA.

As a pre-emptive move, the global airline industry has cancelled flights now because it does not want to become the virus carrier. British Airways, Cathay Pacific Airways, Delta Airlines, Egypt Air, Air India, Air Canada, Emirates, Ethiopian Airlines, FinnAir, Hainan Airlines, Israel Airlines, American Airlines and Air Tanzania have called off all or a few select flights within a couple of weeks of the outbreak in China.

**THE WORLD
HEALTH
ORGANIZA-
TION SAYS
IT IS NOT
A MATTER
OF “IF”
ANOTHER
PANDEMIC
WILL STRIKE,
BUT “WHEN”
IT WILL STRIKE**

So there is no doubt that an outbreak of a large-scale pandemic will rattle the global economy. The World Bank estimates that a global influenza pandemic akin to the scale and virulence of the one in 1918 would cost the world economy US \$3 trillion, or up to 4.8 per cent of the world’s GDP. The cost would be 2.2 per cent of GDP for even a moderately virulent influenza pandemic.

ARE WE PREPARED?

The answer to this question depends on three conditions: nobody knows what virus will cause the pandemic; how virulent will it be; how many people would be killed or infected; and, if any symptomatic treatment will work. The shocking thing is that no country has developed precautionary safety protocols as prescribed by WHO—planning and coordination, situation monitoring and assessment, prevention and containment of virus, health systems response and communication for awareness.

“National health security is fundamentally weak around the world. No country is fully prepared for epidemics or pandemics, and every country has important gaps to address,” warns the Global Health Security (GHS) Index report prepared by the Johns Hopkins University and Nuclear Threat Initiative. There are certain parameters upon which countries are ranked. On a scale of 100, almost all countries scored only 40.2. Less than 7 per cent countries scored better in terms of prevention of pandemic. Worse, less than 5 per cent countries had a rapid response strategy, says the report.

A *British Medical Journal* paper on global preparedness published last year highlighted the most prepared countries were concentrated in Europe and North America, while the least prepared countries were clustered in Central and West Africa and Southeast Asia. But coronavirus is also becoming a great leveller. It is attacking both rich and poor

TURN TO P44 ►►

"Peak season for coronavirus is yet to come"

ERIC FEIGL-DING, an epidemiologist at the Harvard Chan School of Public Health, USA, spoke to **DOWN TO EARTH**

Do you believe in reports that there was a cover-up by China in early December?

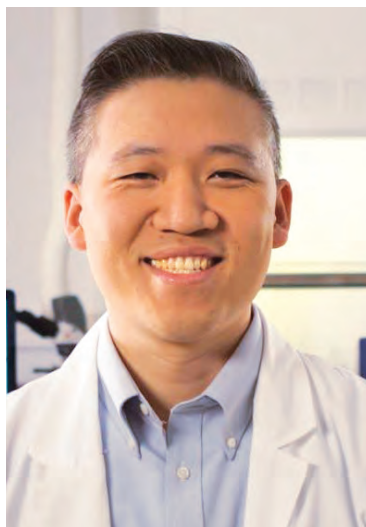
I do not want to go into the politics of cover-up, but I do believe that China delayed a little bit in ramping up public health facilities in the initial days due to which crucial time was lost. More significantly, even at present a lot of underdiagnosis is happening because the labs have reached saturation point and are facing shortage. So the actual number of cases can be much higher.

What about the controversy in the number of people affected?

It is true that the number of cases is high. You may still not be counting the milder cases. There are reports that patients are being turned away in Wuhan. Everyone agrees the difference could be of eight times at least in the epicentre.

WHO has not announced bans, but many countries have imposed full or partial bans.

No doubt the transmission rate is very high. But before imposing blanket bans,



countries would keep people coming from China under quarantine for 14 days—the incubation time period. This was a pragmatic approach. And one has to understand whether such travel bans, if at all they were to be implemented, were required only for Wuhan city, the epicentre of the outbreak, or entire China. Countries should be rational about it.

What about the fact that human-to-human transmission has happened in more than five countries other than China?

It has happened, but it is restricted to close family members.

How much is this coronavirus outbreak comparable with SARS?

The reproductive number (R_0) of SARS varied from 2 to 2.5, at some places even 4. The R_0 of this outbreak is nearly 2.6. But what is important is SARS took three months to reach a number of close to 8,000. In the case of COVID-19, in a little over one month's time, we are close to a tally of 41,000. This exponential growth should worry us while we still do not know the exact reasons for it. In the case of SARS outbreak, there were hardly any asymptomatic cases. But in the current outbreak, there are many. This poses a great challenge to us because they may go unreported and later lead to infections.

Have the number of cases peaked? What can you say about the possible trajectory?

It is very difficult to talk about a possible trajectory, but one thing can be said that the peak is yet to happen. This is expected by the end of February, after which the cases may begin to come down. Viruses do not usually like summers.



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A researcher at the Bonn Faculty of Medicine in Germany looks at bat and human cell culture models to characterise and compare coronaviruses

countries. And there is no vaccine available. So those in rich countries are surviving only on symptomatic treatment.

Since the world was sure that the next pandemic would be a flu pandemic, efforts have centred around developing the universal flu vaccine—the one which will give protection against existing and future strains of flu. The US-based National Institute of Allergy and infectious Diseases is leading one of the initiatives to develop a universal flu vaccine.

“At present, seasonal influenza vaccines protect only against the existing strains of H1N1, H3N2 and two influenza B viruses. The next generation vaccine will provide protection against more than these four viruses and hopefully against other circulating strains and also the future ones that may emerge,” Jennifer Gordon, influenza vaccines program officer with US’ National Institutes of Health, told *Down To*

Earth. The vaccine will provide 75 per cent immunity; existing vaccines are providing only 10-60 per cent immunity.

There are several probable candidates for a universal flu vaccine—many are under clinical trials and one has already reached the last phase, the human trial, as animal studies have shown positive results. “However, we don’t know when the final product will be out and what it would cost,” says Gordon. WHO and philanthropic bodies are funding such research initiatives. Though there are many public and private initiatives to develop a universal flu vaccine, there are only a few projects in infancy to find a vaccine for coronaviruses.

But whatever be the nature of the next pandemic—be it a coronavirus or a flu virus—what would be immediately required for the world is to contain the spread of the virus from one place to another.

PHOTOGRAPH: REUTERS



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"WE NEED TO ADDRESS THE UNKNOWN"

BY CHRISTIAN LINDMEIER

THOUGH MANY experts say the coronavirus outbreak is close to a pandemic, the World Health Organization (WHO) does not believe so. At present, we are in the phase where it's an epidemic with multiple foci, and we will try to extinguish the transmission in each of these foci. Previous coronaviruses including SARS and MERS didn't lead to a pandemic when they first emerged. However, we still do not know much about this virus. That's why WHO is monitoring the evolution of this outbreak every minute with a network of scientists, clinicians, disease trackers, governments, supply chain experts and partners from the public and private sector.

In fact, WHO declared the new coronavirus COVID-19 a Public Health Emergency of International Concern (PHEIC) on January 30, 2020. This is the sixth time a PHEIC has been declared—the previous ones were H1N1 in 2009, Polio in 2014, Ebola in West Africa in 2014, Zika in 2016, Ebola in the Democratic Republic of Congo in 2019. Following the declaration of a PHEIC, WHO has issued temporary recommendations. These measures address travel, trade, quarantine, screening and treatment to make sure countries are prepared to deal with this outbreak. They can also set global standards of practice in these areas. WHO is also working towards reducing secondary infections amongst close contacts and healthcare workers; preventing transmission amplification events and super spreading events (which happened in the case of SARS); and, preventing further spread.

To reduce zoonotic transmission, we need to identify animal source(s) and limit exposure; equip countries to detect, isolate and provide healthcare for infected patients; and, provide optimised care. We also need to address the unknown through clinical severity, treatment options, epidemiologic studies, diagnostics, therapeutics and vaccines. As WHO's director-general said: "The risk of it becoming more widespread globally remains high."

(The author is spokesperson of the World Health Organization)

Though it has been criticised for its methods, China placed 13 big cities under full or partial lockdown, affecting about 50 million people, to contain the spread. This is happening for the first time in history anywhere in the world. Undoubtedly, this caused hardships to people and experts are divided over its efficacy.

On the one hand, China has locked down its affected regions and on the other, many countries have strictly advised its citizens not to travel to China. So, are there any protocols for such bans? Globally, countries have taken stringent decisions to safeguard their citizens. Russia and Singapore have shut borders with China. The US and Australia have also imposed travel restrictions. Many other countries have moved towards imposing partial bans.

But WHO stands alone. As countries have taken safety measures on their own, WHO has looked at the tottering economy and not issued a single travel advisory. In fact, Michael Ryan, WHO's director for health emergencies programme, defends this stance. "If all 191 countries behave in a manner they wish to, there will be no alignment in our response and it will only add to the problem," says Ryan.

WHO is expected to take the lead during such emergencies, but has supped with China and has defended it. It did not reprimand China for delaying the news of the outbreak. Ironically, the Chinese authorities admit the cost of delay. "It's a moment of shame. If we had taken strong measures earlier, the outbreak would have been under control," Ma Guoqiang, Wuhan Communist Party Secretary, told the state broadcaster China Central Television on February 1.

WHO's ambiguous position on COVID-19 should force countries across the world to devise strategies, build health and emergency infrastructure. Meanwhile, to follow what trajectory the novel coronavirus takes, watch this space. **DTE**

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TARGET BEYOND REACH

India makes last-ditch attempt to popularise rooftop solar to meet its 2022 targets

SHWETA MIRIAM KOSHY NEW DELHI



Rooftop solar systems are a huge hit among commercial and industrial establishments. In 2015, Cochin airport became the world's first to be completely powered by solar energy. It produces about 40 MW and saves over ₹1 crore annually in power bills

IN 2015 when India announced that 40 per cent of the 100 GW of solar power targeted under the National Solar Mission (NSM) 2022 will be sourced from solar rooftop (SRT) systems, the task appeared simple. Although large solar farms, which are responsible for generating 60 per cent of the target under NSM, are a cost-effective way of harnessing solar energy, the idea of sourcing one's own electricity just by putting panels on the rooftop is alluring. However, with two years to the deadline, SRT sector appears nowhere near the target.

Data with the Ministry of New and Renewable Energy (MNRE) shows that by December 2019 the

country has added only 2.3 GW from grid-connected SRT systems. "We have actually managed to install 1.9 GW of grid-connected SRT systems under NSM," Aujender Singh, deputy secretary, MNRE, tells *Down To Earth*. "It's a mistake to place the SRT sector in a silo," Singh says, suggesting to increase the scope of large solar farms to meet the 100 GW target.

The suggestion sounds bizarre at a time when countries worldwide are promoting SRT systems. For instance, SRT systems account for 57 per cent of Australia's total solar power capacity. The figures are over 70 per cent for Germany, 36 per cent for the US and almost 50 per

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cent for Brazil. Then why is the SRT sector not able to take off in India? Understanding this is important at a time when the government is rolling out phase-II of Grid Connected Rooftop (GCRT) Solar Programme to give new impetus to the SRT sector.

So far, SRT sector has largely remained a non-performer in India because installing it and recovering the investment is an arduous task for residential consumers. In Delhi, says Ashok Kumar Jha, assistant general manager with Indraprastha Power Generation Company Ltd, several residents welfare associations (RWAs) had to scrap SRT projects after they failed to arrange financiers. Banks consider the projects as high-risk loan despite the Reserve Bank of India including the sector

to receive for the excess electricity his SRT system feeds into the grid. Like most prosumers (producer-consumers), Thaha has installed a net-meter, under which the surplus electricity generated is supplied to the grid. discoms allow prosumers to “bank” this power for a year and draw it back at any point. At the end of the “banking” period, discoms compensate consumers for any excess generation. But when he approached the Kerala State Electricity Board, officials said they were still working on a tariff plan for compensating him. Moreover, there are examples of inordinate delay in installation of net-meters. The Tamil Nadu Generation and Distribution Corporation Ltd admits to year-long delays in installing net-

their capital investment in just five years. A case in point is Cochin airport, which has a 40 MW installation that powers all its operations. “Annually, the system saves the airport a significant ₹1.1 crore, which will help us recover the cost in four to five years,” says Satish Kumar Pai, chief engineer, Cochin International Airport Ltd.

Unfortunately, c&i establishments will no longer be eligible for government subsidy in GCRT phase-II. This might dampen the interest of the only segment that has exhibited an appetite for SRT systems. What’s worse, under the new regime, discoms that have been dragging their feet over SRT system installations, will be the sole facilitators. They will also be responsible for subsidy disbursal, notes the guidelines issued in August 2019. While the guidelines have set parameters for incentivising discoms for creating an ecosystem for expeditious implementation of SRT projects, it appears too small for the cash-strapped utilities.

Industry experts offer a few suggestions that can help the country realise its full rooftop solar potential. Neha Agrawal, head of corporate strategy, Vikram Solar, says the government should offer easy financing options, set up a larger fund for SRT subsidies and ensure their faster disbursal. Ritu Lal, senior vice-president at Amplus Solar, however, suggests the need for structural reforms in electricity tariff. For a large segment of households, electricity tariffs do not reflect the true cost of electricity supply. Reserving these subsidies only for the poor and agricultural communities will force high-income households to shift to cheaper SRT systems. **DTE**

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SO FAR, SOLAR ROOFTOP SECTOR HAS LARGELY REMAINED A NON-PERFORMER IN THE COUNTRY AS INSTALLING IT AND RECOVERING THE INVESTMENT IS AN ARDUOUS TASK FOR RESIDENTIAL CONSUMERS

in its “priority sector lending” norms. Subsidies on SRT systems, as assured by the government, are also hard to come by. In 2017, the RWA of Wellington Estate in Gurugram, Haryana, installed a 200 kW SRT system by paying ₹1.05 crore from its own pocket. “We should have received 30 per cent of subsidy soon after installing the system but are yet to get it,” says resident Vineeth Bagga. In Thiruvananthapuram, Kerala, P S Thaha installed a 15 kW grid-connected SRT system in 2018. Though he could avail the subsidy within a couple of months and now saves almost ₹1.4 lakh a year on his electricity bills, it will take him more than seven years to recover the investment.

Thaha is, however, worried about the payment he is supposed

to receive for the excess electricity his SRT system feeds into the grid. Like most prosumers (producer-consumers), Thaha has installed a net-meter, under which the surplus electricity generated is supplied to the grid. discoms allow prosumers to “bank” this power for a year and draw it back at any point. At the end of the “banking” period, discoms compensate consumers for any excess generation. But when he approached the Kerala State Electricity Board, officials said they were still working on a tariff plan for compensating him. Moreover, there are examples of inordinate delay in installation of net-meters. The Tamil Nadu Generation and Distribution Corporation Ltd admits to year-long delays in installing net-

BUT BIG ONES BENEFIT

The only segment that appears to have benefitted are commercial and industrial (c&i) establishments. They are responsible for 70 per cent of all SRT systems, as per Bridge to India, a leading knowledge service provider in the Indian renewable energy market. Apart from the huge rooftop space available at c&i establishments and their technological and maintenance capability, the reason they have taken to SRT is the economic benefit it provides in a relatively short period. Since the power tariff for commercial installations in India is much higher than what it is for the residential sector, c&i establishments can recover

Palette

WHAT'S INSIDE

Why common spaces remain almost ignored in urban planning **P52**

Discrepancy in universe's expansion rates could indicate some new physics **P56**

RECOMMENDATIONS

DOCUMENTARY



Drawing from major headlines, the documentary series exposes corruption in the food industry. The episodes that feature commentary from the people who lived through these incidents shed light on the surprising and at times downright disgusting ways that common food products are brought to market.



Mathematics professor David J Hand shows how data, just like the universe, is full of dark information that remain invisible to us but are nonetheless present. Using real life examples, such as the Challenger shuttle explosion to financial frauds, Hand talks about the crucial gaps in today's era of big data and provides readers a practical guide to identify missing data and make good decisions.

EXHIBITION



The World Press Photo Exhibition 2020 premieres at the De Nieuwe Kerk in Amsterdam, Netherlands, on April 18. The exhibition will feature the winning photographs of this year's World Press Photo Awards, to be announced on April 16. The photographs will be exhibited till July 26 after which they make an extensive tour of over 120 cities worldwide.

Can we triumph over tragedy of commons?

The battle to save Mumbai's Aarey forest, where the authorities resorted to midnight chopping of some 2,000 trees to make way for the Metro Rail car shed, has grown into one of the most prominent environmental campaigns in recent months. As citizens and environmentalists call out that construction inside Mumbai's last remaining lungs will affect the temperatures and rains, and result in huge floodings in the city, the movement highlights the growing frustration among people due to poorly conceived urban growth and chaos. Be it parks, public squares, green spaces or sidewalks, urban folks are increasingly realising the importance of shared spaces in providing clean air and water supply, preventing floods droughts and heatwaves and ensuring their physical and mental well-being. Then, why are urban planners hesitant to re-imagine the urban commons? **JITENDRA** reaches out to experts to understand the scope and limitations.



**HARINI
NAGENDRA**

Professor of sustainability, Azim Premji University, Bengaluru

"Commons are almost ignored in city planning"

The word commons evokes the imagery of a rural landscape—a village with ponds and grazing lands surrounded by forests. Though commons are equally essential for cities, the

fact remains almost ignored in urban policy and planning. Thus, in the heart of Bengaluru, cows graze on the edges of lakes and community fishing is practised in waste weirs; and in Mumbai, adivasis hunt and forage for food in Sanjay Gandhi National Park and Agaris use coastal and creek-side land for salt panning. We have forgotten that the commons act as a nutritional buffer and safety net for migrants who flock to cities from distressed parts of the country by providing them with wild plants, greens and brushwood, places to bathe, defecate, wash clothes and protection from winter nights.

The middle class and wealthy residents of the city are no less dependent on the commons, though they may not recognise the extent of it. Lakes, parks, wetlands, rivers and even roadside trees play a role in cleaning the air, raising groundwater levels and maintaining people's physical and mental well-being.

Yet, across cities the commons seem to be the most dispensable of spaces. Forests like Mumbai's Aarey are threatened for infrastructure projects, wetlands in Thiruvananthapuram acquired for technoparks and trees in South Delhi felled to build apartments. While the ecological consequences of the

damage (which include floods, droughts and heat waves) are widely discussed, the social outcomes receive less attention. Commons represent those rare spaces in increasingly segregated cities where the rich and the poor can still meet, children of all classes play together and collaborations for conservation can occur.

However, smart city plans and restoration projects take an approach that de-commonsises the commons by evicting people who depend on them most. Beach sides, river fronts, lakes and parks become gated spaces, accessible only to those who can pay, and available only for recreational use, often coupled with “entertainment” in the form of flashing lights, loud music and food courts that evict wildlife. Our cities can hold out any promise of a better future only if the commons play a central role in urban planning.

“Local bodies must take lead”

Traditionally, the commons were managed sustainably by communities whose culture and livelihoods were intrinsically linked with them. Over last few decades, unplanned urbanisation, commercialisation of land, encroachments and over-exploitation of resources and unravel-



CHETAN VAIDYA

Former director, School of Planning and Architecture, New Delhi, and the National Institute of Urban Affairs, New Delhi

ling of traditional structures have resulted in their deterioration.

There is also a pronounced lacuna in the governance and regulations of urban commons. In recent years, civil society groups and citizen-activists have stepped in to fill this gap. Some notable models include the initiative by The Nature Conservancy in Chennai to restore wetlands through scientific reclamation of lakes and catchment areas by involving local communities; civic engagement in lake management in Bengaluru through partnership with the authorities; and the movement for a “*raahgiri*” (car free) day for use of roads by residents in Delhi.

The moot question is how to replicate and scale up such “islands of excellence”. The governance of urban commons should be integrated with the “right to the city” initiatives. Local

governments should lead the way in setting up regulations, providing incentives and mentoring start-ups by millennials. These measures may result in the transformation of the “tragedy of the commons” into a triumph.



“Develop financing framework”

In legal and technical terms, urban commons are owned by local bodies and thus are not un-owned or pure commons. But in practice, they are open access and close to “pure commons”. Since anyone could appropriate

RAVIKANT JOSHI

Urban finance and management specialist

the urban commons at any time without any restriction, it becomes difficult to finance them through private sector. Cooperative or community funding also becomes difficult as most urban commons do not have clearly defined, limited and stable pool of appropriators. This is the reason, financing of the urban commons by the private sector or by communities is confined to development and maintenance of traffic islands, parks, stadiums, streets or footpaths, that too in a limited number.

So, urban commons are mainly dependent on governments, particularly local governments that are more often than not financially weak. The result is inadequate or no financing of the urban commons. There is an urgent need to come out with clear-cut policies, regulations and financing frameworks or mechanisms for urban commons so that their development, maintenance and regulation can take place through investment by private and social sectors.

"Rethink their management"

As cities re-emerge as capitalist utopia for investors and consumers, the "commons" get converted into "commodities". This loss of urban

"commons" and "communing" among larger public have a direct impact on the way a city and its society are structured. Today, what can be considered as the "commons" is no more limited to the traditional understanding of shared natural resources but include a wide spectrum of urban elements, from ecological commons such as water bodies, air and landfills, to civic commons such as markets, parks, gardens, public transportation and sanitation systems. It also includes intangible aspects, such as socio-cultural commons that consist of various forms of art and customs, collective practices, equitable value generation and collaborative digital platforms. The concept of communing, however, has been largely confined to guerrilla actions to co-produce and self-manage community gardens or reclaim derelict spaces and turn them into community hubs, like pop-up plazas and parklets in Kuala Lumpur, Malaysia.

However, the big question is how can the public or community govern and design the areas they share in common. Traditionally, the commons were governed by customary rights of communities. For communing to once again become main-



SHRUTI HEMANI
Urban designer
and academician
based in Jaipur

stream, it would require new forms of collective governance, also referred to as multi-stakeholder governance in which the community or public is not just a user but partner with the state authorities and other players, such as social innovators, knowledge institutions and civil society groups.

The commons must function outside of the capitalist market demand and be co-designed by communities and other stakeholders. Here, the designer acts as a facilitator while the design provides a framework that enables communities to work together to produce and govern commons that are accessible, safe and of high quality. Planners can play a role by identifying and allocating the commons as well as developing mechanisms to co-fund initiatives that revive the traditional commons and develop new urban commons. **DTE**

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“DISCREPANCY IN UNIVERSE’S EXPANSION RATES COULD INDICATE SOME NEW PHYSICS”

IN 1998, SCIENTISTS DISCOVERED THAT THE RATE AT WHICH THE UNIVERSE WAS EXPANDING IS INCREASING. LAST YEAR, A GROUP OF SCIENTISTS CALCULATED THAT THIS RATE OF EXPANSION IS 10 PER CENT HIGHER THAN THE EARLIER CALCULATION. **AKSHIT SANGOMLA** SPEAKS TO **ABRAHAM LOEB**, CHAIR OF THE DEPARTMENT OF ASTRONOMY AT HARVARD UNIVERSITY, ABOUT THE REASONS BEHIND THE DISCREPANCIES IN UNIVERSE’S EXPANSION RATES AND THE FORCES PULLING THE UNIVERSE APART

The expansion of the universe is accelerating and scientists do not seem to agree on its rate. Why?

All observers agree that the expansion of the universe is accelerating (owing to “dark energy”, whose nature we do not understand, but which represents the energy of vacuum without matter). But there is a debate regarding the expansion rate. We can infer the expansion rate that the universe should have today based on the data we have on the cosmic microwave background [CMB is an elusive radiation that emanated at or after the birth of the universe and extrapolating its trajectory to present time is one of the ways to calculate the expansion of the universe]. But some observers who measure the actual expansion rate today argue that their measured value disagrees with the expected value at a statistically significant level.

Some scientists are calling for new physics to explain the discrepancies. What could this new physics be?

The discrepancy in expansion rates could indicate some new physics or some unexpected behaviour of dark matter and dark energy between the time when the cosmic microwave background was produced (400,000 years after the Big



Bang) and today. We do not know if that is the case. [Scientists estimate that 27 per cent of the universe is dark matter which does not absorb, emit or reflect light and whose existence is inferred only from the gravitational effect it seems to exert on visible matter.]

How close are we from understanding the true nature of dark energy and dark matter?

We have evidence that there is much more matter out there than the ordinary matter we are made of. First, the inhomogeneities at early times would have been smoothed out by the radiation if there was only ordinary matter. There needs to be a type of matter that does not couple to the radiation in order for galaxies like the Milky Way to form. Second, when we look at galaxies, we infer that they must contain much more mass than the visible mass of their gas and stars. This was known for 70 years, since Fritz Zwicky inferred that clusters of galaxies contain much more matter than their visible mass. But we still have no clue as to the nature of that dark matter. It is most likely made of particles that do not couple to light (this being the reason that we cannot see them), but we do not know what particles these are.

The breakthrough in our understanding could come from laboratory experiments. There were hopes that new particles will be produced and discovered at the Large Hadron Collider or other experiments, but so far we have had no success.

How sure are scientists about the Big Bang Theory as the event with which it all began? The Big Bang model is supported by a large body of evidence. It

postulates that the universe started from a hot dense state, and we have detected the relic radiation left over from that state. The model also assumes that the initial state was nearly uniform with small inhomogeneities that grew over time due to the attractive force of gravity to make the structure we see today in the form of galaxies and stars, of which the Milky Way hosting our Sun are examples. Indeed, we find the cosmic microwave background to have almost exactly the same brightness in all directions in the sky with small variations of the appropriate magnitude, reflecting the expected initial state. The model also predicts the abundances of light elements, like helium, deuterium and lithium, which were cooked in the first few minutes of the cosmic expansion

MOST OF THE MATTER AND ENERGY IN THE PRESENT-DAY UNIVERSE ARE DARK. WE CALL THEM "DARK MATTER" AND "DARK ENERGY", BUT THESE ARE JUST LABELS THAT SIGNIFY OUR IGNORANCE

after the Big Bang (when the universe as a whole was hotter than the interior of stars). The predicted abundances agree with observations. Altogether, the data we have provides robust support to the Big Bang model but it also leads to intriguing questions:

(i) What led to the Big Bang? In the very first instants, quantum mechanics was as important as gravity, but we still do not have a theory that unifies these two pillars of modern physics and so we cannot predict what may have happened before the Big Bang.

(ii) We infer from cosmological data that most of the matter and energy in the present-day universe are dark. We call them "dark matter" and "dark energy", but

these are just labels that signify our ignorance.

What will the near and far future of the universe look like with and without humans?

Without humans: in a few billion years, the Milky Way will collide with its nearest neighbour, the Andromeda galaxy and the night sky will change. In about seven billion years, the Sun will die. First it will expand to a red giant and possibly engulf the Earth and then its core will cool and contract to make a "white dwarf", a piece of dense metal the size of the Earth. Most of the stars have a mass that is 10 times lower than that of the Sun and they will continue to shine for up to 10 trillion years (1,000 times longer than the Sun). After that, there will be darkness. If the

accelerated expansion of the universe continues, it will become a dark and lonely place with our galaxy (the merger product of the Milky Way and Andromeda) surrounded by vacuum.

With humans: since technology evolves exponentially with a time constant of a few years, we will witness vast advances in Artificial Intelligence (AI), robotics, and genetics. Within a thousand years, humans will build machines that transcend them and can venture into a long journey into space. 3D printers equipped with AI will produce life as we know it on other planets out of the raw materials there. We might also find evidence for other civilisations that are far more advanced than we are. [DTE](https://downtoearth.org.in)

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Beware a deal with Trump

A CLOSE RAPPORT between leaders of nations with divergent and almost contradictory interests may not always be a good thing when one of them is economically powerful and is the leader of a country known to pander to mega corporations, specially Big Pharma. As Donald Trump comes visiting later in February, a number of organisations are on edge about the kind of deal that Narendra Modi is likely to sign with the US President since his government has shown a readiness to address the concerns of major trade partners such as Japan by offering a controversial fast tracking of patent approvals.

Reports hint at a mini deal with the US since a full-blown Free Trade Agreement (FTA) is still in the making and fears are that intellectual property (IP) is likely to be a major focus because this is an issue that has loomed large over India's trade negotiations with the US, Japan and the European Union. In the case of the US, it has been a constant irritant with Washington keeping up a fierce campaign against crucial parts of India's patent law, particularly those covering pharmaceuticals. A fixed point of dispute has been Section 3d of the law which seeks to curb the notorious tendency of Big Pharma to extend its drug patents through minor tweaks to the original drug. After a failed case in India's Supreme Court, the US has kept up its attack on India's patent regime, with its Super 301 review never failing to target India.

With a trade deal in the works, civil society groups have been urging Modi not to negotiate an FTA with US, primarily because it would impede access to affordable

healthcare in India where availability of low-cost generic medicines have provided a lifeline to millions of poor patients. These groups have said they are aware that the US has sought specific amendments to the Indian Patents Act, which would undermine "India's public health friendly patent laws".

The worry now is that Trump arrives triumphant in Delhi on the back of a new trade pact he has just signed with China. The Phase One trade deal he signed on January 15 sets up patent protections in China that are similar to those in the US and it would be worthwhile for officials of India's Commerce Ministry—and, of course, activists—to study what Washington has

As Trump comes visiting there is worry about the demands he will make on intellectual property

actually secured from Beijing. The most disquieting concession is China agreeing to implement patent linkage and patent term extension. Patent linkage is dangerous because it

means that marketing approval for a generic drug cannot be granted before the expiry of the patent on the original drug. This would delay the entry of cheaper generic medicines and protect brand drugs from competition.

Big Pharma appears to be the big winner since Beijing has agreed to even extend the patent term in case of regulator delays, leading industry analysts to hail the IP concessions signed by the Xi Jinping government as the most significant part of the deal. But even as some are crowing, other analysts emphasise that much will depend on how China abides by the deal. Some measures are said to be old promises which China is implementing in its own way. Perhaps, Delhi needs to learn from the Chinese how to keep Trump happy without losing the plot. **DTE**

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