WORLD ENVIRONMENT DAY SPECIAL

1-15 JUNE, 2021

Down To Earth

FORTNIGHTLY ON POLITICS OF DEVELOPMENT, ENVIRONMENT AND HEALTH

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# COVID HITS HOME

The pandemic's spread to rural India will have huge economic ramifications for the country in the months to come



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# The real oximeter

CELEBRATING WORLD Environment Day in the time of an ongoing horrific health pandemic is difficult to contemplate. In this time of immense human grief and loss, what does the environment even count for? But take a moment to reflect. The most important element that we gasped for in the past month was oxygen. Think of the hours and days we spent finding oxygen for our loved ones; how we saw patients collapse and die because hospitals did not have oxygen in the tanks; how the courts stepped in to regulate the transportation of oxygen from industries across the country; how we learnt about the business of oxygen concentrator—a machine that sucks in air and gives us oxygen on demand. Our desperation cannot be recounted without pain. We saw the gasp for each breath—and just how precious it is. This then is what we must remember this World Environment Day. The oxygen that we get from nature is about increasing green cover and ensuring that our air—our every breath—is not polluted. Something we talk glibly about and yet discount with our next move.

The theme of this year's World Environment Day, celebrated every year on June 5, is ecosystem restoration. Increasing the tree density and repairing the ecosystem health means the world will sequester carbon dioxide—that is filling up our atmosphere and leading the world to an inexorable downward spiral of climate change impacts—and release oxygen. It's a win-win. But what we need to understand is that planting trees or restoring ecosystems will require us to first restore our relationship with nature and society.

The fact is trees are about land—who owns it; who protects and regenerates it, and who has the rights over the produce. In India, the forest department has the "ownership" of vast areas of common forest land. But countries like India do not have "wilderness". Instead, we have habitats where people coexist with wild animals in forests. These are the same forest districts classified as the most backward and poorest. It is also a fact that using all the legal and administrative, and sometimes, muscle power, the country's forest department has kept the tree cover somewhat intact. It works hard every day to keep people and their animals out. It shuffles files between the bottom rung of guards and the top bureaucrats to minimise the cutting of trees for "development" projects—from mining to dams.

**What we need is an evergreen revolution that secures livelihood, provides for energy security and combats climate change**

But "growing" trees needs people to take ownership of its management; so that livestock is kept out; so that the saplings survive. More importantly, trees have a value—whether for their ecosystem services or for timber—which needs to be paid to the grower. This would then make for a tree-based renewable future—where timber can be used for making houses and wood for generating energy. This will be an evergreen revolution that puts money in the hands of the poor; secures livelihoods; and at the same time provides for energy security and combats climate change.

Today the entire world is talking about nature-based solutions—what I have described above—but without putting the poor community at the centre of the solution. The reason is not difficult to understand. It is about the political economy of land tenure; the power of the most voiceless and marginalised; and about the cost of growing trees when people matter. In this scheme the value of land and labour needs to be paid for, not in terms of the cheapest options for mitigating carbon dioxide from the air but in terms of livelihoods that this solution will provide. This will make the entire idea of buying cheap carbon offsets unfeasible.

Then, of course, there is the challenge when with every breath we inhale poison and not oxygen. We discuss this every year, when winter comes and the pollution gets trapped in the heavy air and moisture. We feel it then. We scream. But then we forget. So, just as winter ended this year, the Indian government decided to change the rules for coal-based thermal power plants to give them a licence to pollute. Simply, it said, you can pay for non-compliance and this penalty will be lower than what you would spend on pollution control equipment. The rules are oxygen for the power companies and death by breath for the rest of us.

The fact is our oxygen cannot be secured in a cylinder or by an oxygen concentrator machine that I suspect every rich Indian household will now buy and keep. It cannot even be secured by the air purifier that we already have bought and installed in our houses and offices. Instead, oxygen needs us to value it as the most important and critical life-support system of our world. So, this World Environment Day, when the ravages of the pandemic have left us angry and shattered, let's not beat around the bush any more. We know today, more than ever before, that talking the talk does not save lives. We need to walk the talk. The oxygen in this battle for a greener and more inclusive tomorrow is our common anguish—this is our fight for survival. Nothing less. DTE @sunitanar

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# Engage



PHOTOGRAPH COURTESY: ROTHAMSTED RESEARCH INSTITUTION

## An experiment with immense potential

The refers to the article "Breaking new ground" (16-30 April, 2021). The Broadbalk field experiment, which has been going on for 175 years, makes quite a significant contribution to science as it reveals the potential of soil to improve the yield of a crop like wheat through different methods. However, it is not known whether the density and diversity of the Broadbalk soil has been tested. In a bioethical context, it is imperative to experiment with the soil to increase fodder productivity for livestock.

Joseph Henry Gilbert and John Bennet Lawes, the original researchers behind the Broadbalk experiment and the founders of the Rothamsted Research institute in Harpenden, UK, have also been the pioneers in the production of synthetic chemical fertilisers. By acidulating phosphate rock with sulphuric acid, they introduced to the world for the first time a chemical fertiliser, thus paving the way for a whole new agrochemical industry. Therefore, from an agroecological perspective, such long-term studies should be conducted worldwide in all major agricultural experimental stations, keeping in mind the benefits derived from them and the potential to improve, maintain and sustain all forms of life on Earth.

**SRINIVASA KUNUTHUR**
**VIA EMAIL**

## The last of Gandhi's men no more

Kalyanam Venkitaraman, personal secretary to Mahatma Gandhi, recently passed away in Chennai. He was 99. He had joined Gandhi's *ashram* as a volunteer in 1942 (for the salt *satyagraha*) and become his personal secretary following the demise of Mahadev Desai, the right-hand man of the father of the nation. Venkitaraman was standing a yard behind Gandhi when the latter was assassinated on January 30, 1948. Years later, he made news by saying that Gandhi's death was instant, and that he never uttered the words "*Hey Ram*" as is believed in popular culture. With Venkitaraman's death, we have lost the last grand old *thatha* (grandfather) of the Independence era.

**C K SUBRAMANIAM**
**NAVI MUMBAI, MAHARASHTRA**

## No stopping stray cattle

This is with reference to the article "India needs to look beyond *gaushala*s to address its stray cattle problem", published online on April 5, 2021. The rise in the number of stray cattle seems to be due to the ban on cow slaughter. Other measures suggested in the article are unlikely to have a major impact. Is there any practical method we could consider, apart from allowing the export of beef, to check cattle numbers?

**VINAY**
**VIA EMAIL**

## Temperature see-saw

The article "Cold comfort" (1-15 October, 2020) predicts a cold period from the years 2020 to 2053, projecting that global

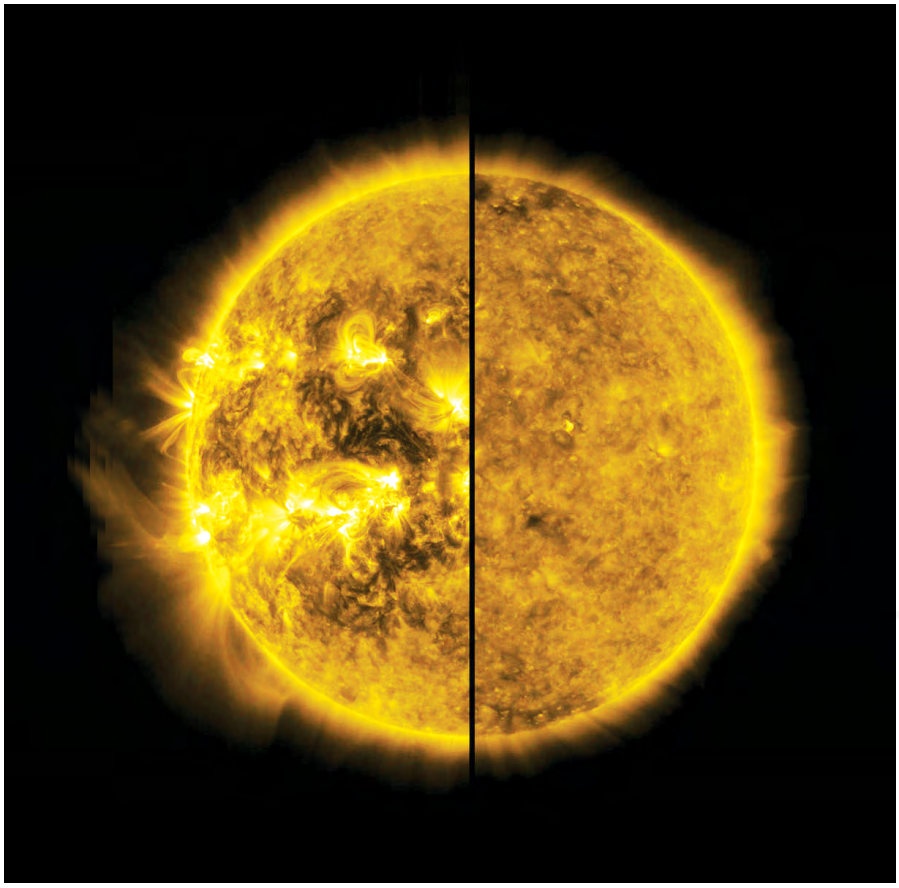


IMAGE: NASA

temperatures will become 1°C to 1.5°C lower. In contrast, the article "All talk, no show" (16-31 October, 2020) states that the world's biggest greenhouse gas emitters are not doing enough to contain emissions and that there is a lurking fear of temperatures rising by 1°C to 1.5°C. Both these articles confuse the narrative on climate change. The bottom line is that powerful nations like the US and China do not show rational behaviour in dealing with climate change and greenhouse gas emissions. Their tendency to flex their muscles on these issues should be the point of focus.

**L R SHARMA**
**SUNDERNAGAR, HIMACHAL PRADESH**

## *DTE responds*

The article "Cold Comfort" (1-15 October, 2020) does not say global temperatures will reduce by 1°C to 1.5°C between 2020 and 2053. It quotes scientific literature which shows that during the Maunder Minimum period from 1645 to 1710, when solar activity reduced significantly and there was no global warming, temperatures had fallen by 1°C to 1.5°C in the northern hemisphere, especially Europe. The article quotes a scientist who predicts global temperatures might fall by 1°C, but counters this with a statement from the US National Aeronautics and Space Administration. With regard to "All talk, no show" (16-31 October, 2020), there is enough scientific evidence that global temperatures are rising, and there is a fear they might increase by 1.5°C or more if greenhouse gas emissions are not curbed.

**DTE TV**

### Overuse of steroids to treat COVID-19 a concern

With COVID-19 patients falling seriously ill, doctors are increasingly prescribing steroids to save them from developing a




hyper-immune response to the virus. A hyper-immune response causes inflammation in the lungs and organ failure, which can be fatal. However, excess use of steroids in early stages of COVID-19 can be quite harmful because it leads to replication of the virus and viral pneumonia. Such cases have a higher mortality rate. COVID-19-recovered patients who used steroids can also develop mucormycosis or the "black fungus" infection.

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# Digest

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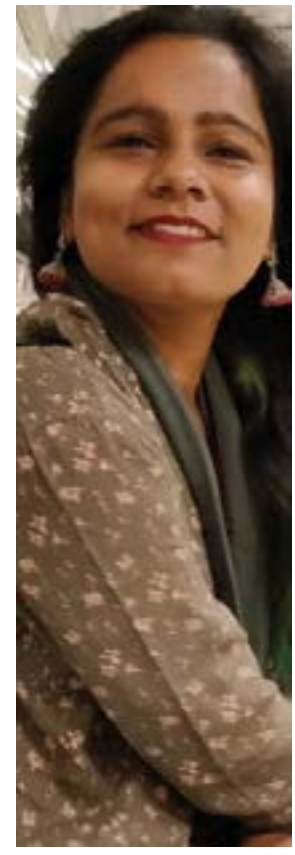
**1,000 WORDS** VIKAS CHOUDHARY



**A trader at a wool market in Bikaner, Rajasthan. India is the ninth largest producer of wool in the world and Rajasthan ranks third among Indian states in terms of wool production units. However, procurement of the indigenously produced fibre has seen a sharp decline over the years, primarily due to the increased use of synthetic wool and imports from countries like China and Australia.**

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# Comfort food

## Home chefs across the country are opening their kitchens to provide healthy meals to COVID-19 patients

**DAKSHIANI PALICHA** NEW DELHI

**THE FIRST** wave of the novel coronavirus pandemic that hit India in 2020 pales in comparison to the severity of the current situation. But for Kamal Kothari and her family, the first wave was quite debilitating.

Kothari, an accountant based in Kolkata, her husband and their two children all contracted COVID-19 last year, around the same time. It was extremely difficult to run the household, and especially to make proper, nutritious meals for everyone. Lockdown and quarantine rules made seeking outside help nearly impossible. "This is why when the second wave began this year, my husband and children decided to help others avoid the hardships we faced," she recalls. "So we began cooking simple, healthy meals for COVID-19 patients and families in Kolkata," she adds.

Kothari makes homely, filling meals of *dal*, *roti*s, green vegetables and curries, cooked in low oil. The meals are delivered by her son or through ride-hailing application Uber's food delivery services. "We charge a nominal amount of ₹75 per meal; for those who cannot afford to pay, the food is for free," she says. To ensure that the meals reach people who truly need it, Kothari asks her customers for a copy of their COVID-19 reports as proof.

Kothari and her family are not the only Good Samaritans that have stepped up amid the increase in COVID-19 cases.



(From left, facing page) Mamta Bhalla, Gurugram; Kamal Kothari, Kolkata; Priyanka Halduniya, Delhi; Amisha Rai, Mumbai; Nupur Birla, Bengaluru; Janaki Kanya Rajesh,Chennai

Several home chefs across the country have opened their kitchens to COVID-19 patients, frontline workers and their families, seeking to share the burden they face while battling the particularly aggressive infection this year.

Like Kothari, Amisha Rai of Mumbai, who used to work for a non-profit, decided to take up cooking for COVID-19 patients after contracting the disease herself a few months ago. Initially, she aimed to only limit her services to a few people. "Even if I could have helped one family, it would have been enough," she says. However, the response to her home-cooked lunch and dinner, comprising *roti*s, vegetables, *upma*, *idli*s, rice and *sambar,* has been overwhelming. "In the two weeks since April 27, when I began providing meals, I have sent out 300 orders," she says.

Rai primarily gets requests through *covidmealsforindia.com*, an online social portal launched by professional chef Saransh Goila of Mumbai to connect home cooks with patients during the pandemic. She charges a nominal amount that varies with every meal. "It is not just patients who have contacted me. One Good Samaritan in Mumbai is arranging free food for people in need during this time; even for those who do not have COVID-19. I help him with meals when I can," she says. Like Kothari, and most other home chefs who are providing meals, Rai sends food through ride-hailing and delivery applications.

While social media helps Rai spread the news of her meals to those in need, for several other home chefs, it has served as a medium of inspiration to take up the task. Nupur Birla of Bengaluru, for instance, began her home-cooked meals service after seeing her friends in Pune doing the same, on social media. She took the help of her mother, Malti Birla, a naturopath and health specialist, to make a rotating menu for clients. "We currently offer oats, soups, rice, breads and mixed vegetables—depending on what the customers want and what is available in the market. All the food is steamed, with very little spices and almost no oil, to keep it nutritious," she says. Prices depend on the portion, she adds.

Janaki Kanya Rajesh of Chennai was also inspired by social media posts of her friends in Australia—where she currently studies—offering meals. But the real push came when she checked on the parents of an acquaintance in Chennai; they had COVID-19 and were unable to cook. "Since I have the resources and I do love to cook, I thought of helping out more senior citizens or those falling really ill due to COVID-19. So I began the lunch and dinner service in Chennai," she says. Rajesh serves around 100 meals a day—lunch is *sambar*, *rasam*, dry vegetables or gravies with rice and proteins such as chickpeas, while dinner is easily digestible food such as *idli*s, *upma* or *idiyappam*. "Initially, I provided food for free; but since people were taking advantage, I now charge ₹50 a meal," she says.

While Kothari, Rai, Birla and Rajesh are currently focusing on reaching those in need and are not keen to expand their services to a full-time business, there are some for whom this was already an occupation. One such example is Mamta Bhalla of Gurugram, Haryana, who quit a high-paying job of a software engineer to pursue a culinary-related career. Business was booming until last year, when the first COVID-19-induced lockdown saw a drop in demand. "At the time, I thought about shifting focus to cater to COVID-19 patients or to those who were in need. But I could not do so because of the restrictions," she says. Since limited movement is allowed this year, she is able to provide meals to COVID-19 patients and families along with other customers. "However, I only deliver within my gated society due to the alarming rise in cases," she adds.

Given the fact that most COVID-19 patients are looking for affordable meals during the quarantine, Bhalla has tweaked her lunch menu from "premium" items such as *rajma*, *chole* and *paneer* to simple meals of *roti*s, *dal*, vegetables and rice. She also provides lighter food for breakfast and dinner; the meals cost ₹80-140. Customers are grateful for the fresh and safely prepared food delivered on the doorstep every day of the quarantine, Bhalla shares. However, she may revert to her original offerings once the cases subside, as juggling two menus would be difficult.

Priyanka Halduniya of Delhi, who had only recently started a home meals service, says the call to cater to COVID-19 patients came from non-profits. "My mother-in-law and I started 'Priyanka's Kitchen' last year as a non-vegetarian meals service. At the end of March this year, when COVID-19 cases rose again, a few non-governmental organisations asked us to help them provide food to patients. So we shifted focus," she says.

Halduniya adheres to government-recommended menus for COVID-19 patients—proteins such as *dal*, rice, *rotis* and vegetables cooked in low oil. The price of one meal is ₹120. "Patients often return explaining how our food helped them recover safely," she says.

There is no doubt that humble, home-cooked meals of such COVID-19 warriors serve as a lifeline for patients.

QUERY

# Arctic warming outpaces Earth's

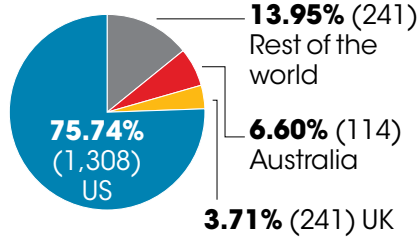
**1 How much has the Arctic warmed?**
The Arctic 's average annual temperature rose by 3.1°C between 1971 and 2019, compared to 1°C for the planet as a whole, says a report released on May 20 by Arctic Monitoring and Assessment Programme (AMAP), a research foundation.

**2 Why is the Arctic warming faster?**
The reasons are not clear. Since 2004, the warming has been at a 30 per cent higher rate than in previous decades. As per one theory, snow-covered ice reflects 80 per cent solar radiation, but open water can absorbs 80-90 per cent of it, raising the water's temperature and making a loop that causes even more melting.

**3 What is the impact of a warmer Arctic?**
Warmer temperatures rapidly melt Arctic sea ice. AMAP says the region's ice cover declined 43 per cent from 1979 to 2019. This raises global sea levels and shrinks habitats of polar animals. Indigenous people are unable to hunt for food. Melting ice caps also open new sea routes for exploration.

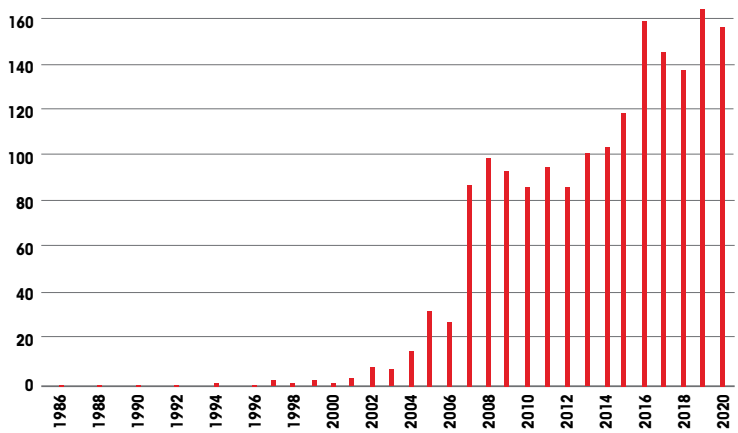
TRACKER

Climate change litigations—that challenge **environmental laws, government policies** and **corporate actions**—have risen globally since the 2015 Paris climate agreement. **The US** has seen most of the **1,727 cases** since 1986.




**1,727 cases recorded between 1986 and 2020**

**OVER 50% OF THE CASES HAVE BEEN RECORDED AFTER 2015**




Source: *Climate Change Litigation Insights into the evolving global landscape*, The Geneva Association, with data from Climate Changes Laws of the World and Sabin Center for Climate Law, Columbia Law School, US

BITS GLOBAL

**Ahead of** their 47th summit in the UK in June, the G7 countries, a grouping of the world's seven largest "advanced" economies, have agreed to stop international funding for coal projects. G7, which includes the UK, France, Germany, Italy, Japan, Canada and the US, said on May 21 that this was the first step to limit the global temperature rise to 1.5°C, in line with the Paris Agreement. In a report on May 18, the International Energy Agency had said that there should be no new oil, gas or coal development if the world is to become carbon neutral by 2050.



**China issued** its first tradeable forest carbon credit stamps at Sanming City in Fujian Province in the eastern part of the country on May 20. Forest carbon credits allow companies to emit a certain amount of carbon dioxide in return for added forest areas. The first five credit stamps issued allow emission of 29,715 tonnes of carbon dioxide into the atmosphere.

**Conflicts and** natural disasters forced 40.5 million people into internal displacement in 2020, says the *Global Report on Internal Displacement 2021*, released on May 20, by the Internal Displacement Monitoring Centre of the Norwegian Refugee Council. Despite COVID-19-induced movement curbs, the total number of people living in displacement within their own countries is now a record 55 million.

**The world's** largest iceberg broke off Antarctica's Ronne ice shelf and is floating in the Weddell Sea. Named A-76, the iceberg measures 4,320 sq km. A-76 was spotted by the British Antarctic Survey and confirmed by the US National Ice Center on May 19. Iceberg breaking is a sign of temperature rise, and their melting can drastically alter sea levels.

## BITS INDIA

**India ranks** third in professional services firm Ernst & Young's (EY) 57th Renewable Energy Country Attractiveness Index released on May 18. India follows the US and China in the list. Its rank improved from fourth last year due to its performance in promoting solar photovoltaic energy as a cost-competitive power source, EY says. The company expects the country's solar sector to outperform coal by 2040.

**A panel** under the Union Ministry of Environment, Forest and Climate Change has allowed a baseline study for the NITI Aayog's Great Nicobar plan for infrastructure development. The decision came after meetings on March 17-18 and April 5-6, as per the website of the Environment Appraisal Committee (EAC) Infrastructure I. However, EAC has also raised concerns about the impact of the project on tree cover, seismic and tsunami risks and protection of wildlife in the Great Nicobar island.



**Kuno National** Park in Madhya Pradesh will get eight cheetahs from Africa in November, under India's first inter-country big cat relocation project, the state government said on May 23. The Endangered Wildlife Trust, South Africa, will donate five male and three female cheetahs. The relocation is part of India's efforts to reintroduce the species after the Asiatic cheetah went extinct in the 1950s. However, conservationists say this may disrupt the ecosystem of carnivores in the country.

**India added** six places on UNESCO's tentative list for world heritage sites—the Satpura Tiger Reserve, the Varanasi ghats, the megalithic site of Hire Benkal, Maratha military architecture in Maharashtra, Bhedaghat-Lametaghat in Narmada Valley and the Kanchipuram temples—the Union culture minister said on May 19. The Archaeological Survey of India proposed nine sites for the list.

## FRAMEWORKS

■ The Ministry of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy (AYUSH) has published the **Draft Drugs and Cosmetics (Amendment) Rules, 2021**. The new rules amend the provisions on manufacturing Ayurvedic, Siddha or Unani drugs for sale, under the Drugs and Cosmetics Rules, 1945.

■ The Meghalaya government has announced an **Electric Vehicle Policy 2021** whose key goal is to ensure 15 per cent all vehlicles in the state are electric. For this, the government aims to bring in 20,000 electric vehicles in the state by 2025.

■ The Jammu and Kashmir administration has sanctioned the implementation of a new **Industrial Policy 2021-30** and its procedural guidelines with effect from April 1, 2021. All industrial units beginning commercial production in the region from April 1 and existing units undertaking expansion shall be entitled to incentives.

## IN COURT

### SUPREME COURT

■ The apex court has directed the Delhi Jal Board (DJB) to approach the Upper Yamuna River Board (UYRB) for allocation of water to the National Capital Territory. DJB had asked the Supreme Court to direct Haryana to provide more water to meet the capital's needs. The court constituted a committee to look into the matter, and noted from the subsequent report that UYRB is responsible for distributing the Yamuna's waters across states.

■ The Supreme Court has asked the Centre and Delhi, Uttar Pradesh Haryana, Maharashtra, Gujarat and Bihar to detail their respective measures to ease the burden of COVID-19 induced lockdowns on rural labourers in cities. The court also directed the Union and the state governments to ensure that such workers are given dry ration, cooked meals and transport to return home.

### HIGH COURTS

■ The High Court of Delhi has asked pharmaceutical company Roche India to explore increasing supply of Tocilizumab 400 MG to treat COVID-19. Roche told the court it plans to supply 10,000 doses in addition to the 33,000 given, but the court noted this is too short of the estimated demand of 180,000 doses.

■ The Telangana high court has directed the state government to ensure legal orders with respect to COVID-19 issues are followed. The court also asked for an affidavit on the state's strategy to handle the potential third wave of the pandemic.

■ In a case on fatalities at the Goa Medical College due to poor oxygen supply, the state's health secretary told the High Court of Bombay at Goa that steps have been taken to ensure oxygen storage at the college.

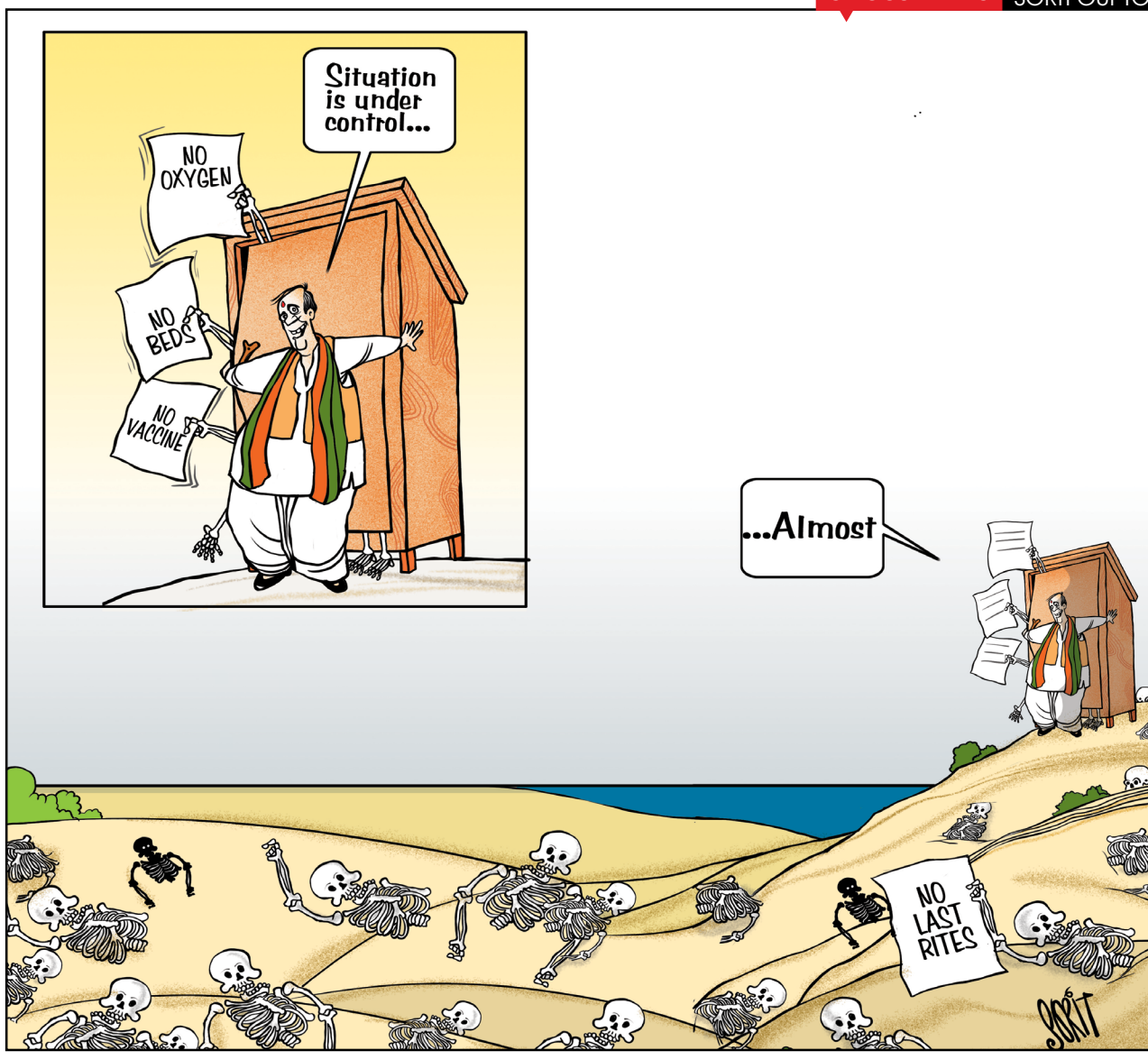
### So far...

Number of cases on environment and development tracked from January 1 to May 18, 2021

| NATIONAL GREEN TRIBUNAL | SUPREME COURT | HIGH COURTS |
|---|---|---|
| 158 | 52 | 74 |

FOR DETAILED VERDICTS, SCAN

CROSS HAIRS SORIT GUPTO




BIG NUMBER

# US $700 billion

The shortage in global funds required to protect the world's biodiversity by 2030

*Source: A Market Review of Nature-Based Solutions:An Emerging Institutional Asset Class by Green Purposes Company and Finance Earth*

VERBATIM



## "WHEN YOU ARE IN A WAR AND YOU ARE ALL ALLIES, YOU MUST USE ALL YOUR WEAPONS WITHOUT HIDING BEHIND PROFIT AT THE EXPENSE OF LIVES"

**CYRIL RAMAPHOSA**

President, South Africa, on COVID-19 vaccine inequity at the Global Health Summit organised by G20 nations. Only 1 per cent of the 1.53 billion vaccines administered globally so far have been in Africa, as per the World Health Organization

Compiled by Aditya Misra, Sanjit Kumar, K M Sheeja, Susan Chacko and Dakshiani Palicha



ONLINE TRAINING ON

# EIA: A REQUIREMENT BEYOND CLEARANCE

**COURSE DATE:** July 1-10, 2021 | **LAST DATE TO APPLY:** June 27, 2021 | **COURSE FEES:** INR 2,500

In 1994, an Environmental Impact Assessment (EIA) Notification was brought in with an objective to minimize the adverse impacts of developmental projects. But it has become a mere clearance process. This is, in part, a result of weakening of the Notification through amendments. But another factor is also responsible for the enfeeblement of EIA.

There are three important stakeholders in an EIA study: project proponent, consultant and regulators. Each of them has a role to play in identifying and quantifying the impacts of a project and implementing appropriate mitigation measures. A good EIA study can actually prove beneficial to the project proponent and save them the cost incurred due to non-compliance. However, there is a lot of ignorance on the mechanism of EIA and this also leads to its non-optimal implementation.

In order to make the process of EIA substantial, clearer and deeper understanding is the need of the hour. To this end, Centre for Science and Environment, is organizing a 10 day-long online training course on the topic.

**Course Objective:** The online course has been designed to capacitate environmentalists and prospective environmentalists to develop a better understanding of the EIA process.

The course will be conducted through presentations, recorded videos, discussion with experts and reading material.

**COURSE COORDINATOR**

**Ishita Garg**
Progarmme Officer, Industrial Air Pollution
**Email:** ishita.garg@cseindia.org

Participants will be awarded a certificate of completion on successful completion of the programme

**KEY TAKEAWAYS**

- Consequences of poor EIA reporting
- Methodology for EIA preparation
- Methodology for data collection
- Analysis of socio-economic impacts
- Preparation of Environmental Management Plans
- Case studies on good environmental practices
- Review and evaluation of EIA reports
- EIA legislation: India and developed countries

**WHO CAN APPLY?**

- Industry professionals, environment consultants and environment engineers
- Researchers and academics
- Students aspiring to work in the field of environment

# Side effects

Rising sea surface temperatures are leading to rapid intensification of cyclones not just in the historically turbulent Bay of Bengal but also in the Arabian Sea

**AKSHIT SANGOMLA** IN NEW DELHI WITH **JAYANTA BASU** IN KOLKATA; **ASHIS SENAPATI** IN KENDRAPARA; AND **HRUSIKESH MOHANTY** IN BERHAMPUR



PHOTOGRAPH: JAYANTA BASU

People trying to stop gushing water in Pather Pratima, Sundarbans, amid rains brought by cyclone Yaas. Tauktae and Yaas impacted several states in the country and forced the evacuation of over 2 million people



IN RECENT history, no other pre-monsoon cyclone did as much damage as the two very severe cyclonic storms that battered India's east and west coasts in May this year. In a span of just 10 days (May 17-26), the two cyclones—Tauktae in the west coast and Yaas in the east—caused extensive damages in seven states and one Union Territory; forced the evacuation of over 2 million people; and caused economic losses to the tune of ₹35,000 crore, show estimates by the state governments. Worse, these cyclones hit most of those states, such as Maharashtra, Kerala and Odisha that were already struggling to curb the spread of COVID-19 pandemic. "Managing two disasters at the same time brought a lot of challenges for the authorities and the general public," says Sanjay Srivastava, chairperson of Climate Resilient Observing Systems Promotion Council, a private firm that works on research and development with regard to natural disasters.

Trends in recent years show that pre-monsoon cyclones on Indian coasts have become frequent as well as ferocious—particularly in the Arabian Sea on the western side, where they are uncommon, as against in the Bay of Bengal to the east that experiences them regularly. Since 1980, this is the first time that the Arabian Sea has seen pre-monsoon cyclones four years in a row. The India Meteorological Department (IMD) has confirmed that Tauktae was the fifth-strongest storm in the Arabian Sea since 1998 and the strongest pre-monsoon cyclone since 2010.

According to IMD's historical data, the decade of 2011-2020 recorded the highest number of cyclones—17— in the Arabian Sea since the 1890s. Of these, 11 were severe cyclones. Moreover, the Arabian Sea saw five of the eight cyclones that hit India in 2019. Normally, the region only records one cyclone in a single year. "(This rise) equals the previous record of 1902 for the highest frequency of cyclones over the Arabian Sea," IMD says in its *Statement on Climate of India During 2019*. In 2020, the Arabian Sea saw two of the five cyclones that hit the country, says IMD data; both were severe.

In the Bay of Bengal, Yaas was the third consecutive severe cyclonic storm to hit the east coast during the summer in as many years, after Fani (April 26-May 5, 2019) and Amphan (May 16-21, 2020). As many as 541 cyclones have formed in the region since the last 130 years, of which 96

(including Yaas) have hit Odisha, says Pratap Kumar Mohanty, professor, marine science, Berhampur University, Odisha. Yaas made landfall in the state's Balasore district on May 26—the 28th one to do so since 1891. This is the highest number for any district in Odisha, adds Mohanty.

## WEATHER AS CATALYST

Tauktae showed some unpredictable characteristics, like many other storm systems in the recent past. The storm intensified into an extremely severe cyclone in the early hours of May 17, which IMD did not forecast till the afternoon of May 16. "Cyclone Tauktae underwent rapid intensification, attaining 'Category 3' status," says Roxy Mathew Koll, climate scientist at the Indian Institute of Tropical Meteorology (IITM), Pune. Rapid intensification happens when a cyclone's maximum sustained winds increase by at least 55 km per hour, within 24 hours. "Tauktae intensified from a depression to a severe cyclone in two days, which is a record. Previously, cyclones took four to five days (to do so)," Raghu Murtugudde, a climate scientist at the University of Maryland in the US, tells *Down To Earth*.

"But the real indicator of its uniqueness is that the cyclone remained strong and stalled after hitting land. This was because of the warm ocean and the outflow of desert winds because of excessive heating in the neighbouring countries of Iran, Afghanistan and Pakistan. These conditions were also responsible for the recent string of cloud bursts in Uttarakhand," says Murtugudde.

Koll, who is also the lead author of the Intergovernmental Panel on Climate Change's *Special Report on the Ocean and Cryosphere in a Changing Climate*, says, "The frequency and intensity of cyclones in the Arabian Sea have increased in recent years because of rapid warming, which has made the relatively cooler area (compared to the Bay of Bengal) a warm pool region that can actively support cyclone formation."

Scientists from the National Oceanic and Atmospheric Administration and Princeton University in the US and the University of East Anglia in the UK analysed 90 peer reviewed articles to understand the impact of a changing climate son tropical cyclones—a combined name used for hurricanes, cyclones and typhoons. In a study published in the journal *Science Brief Review* in March 2021, they have concluded that there could be a 5 per cent increase in maximum cyclonic wind speeds if the world warms by 2°C by the year 2100.

**ARABIAN SEA EXPERIENCED 17 CYCLONES FROM 2011 TO 2020, THE MOST IN 130 YEARS. OF THESE, 11 WERE SEVERE CYCLONES. THEIR FREQUENCY AND SEVERITY HAVE RISEN—TAUKTAE INTENSIFIED FROM A DEPRESSION TO A SEVERE CYCLONE IN TWO DAYS**

The impact is evident already: extremely severe cyclone Fani and super cyclone Amphan intensified from weak to severe category in less than 24 hours due to warm ocean conditions, adds Koll. Even state-of-the-art cyclone models were unable to pick up on this rapid intensification as they do not incorporate ocean dynamics accurately, he says.

The frequency of very severe cyclones in the Indian Ocean region has also increased by one per decade in the last two decades, according to the *Assessment of Climate Change over the Indian Region* published by the Union Ministry of Earth Sciences on June 17, 2020. This is despite a decrease in the overall frequency of cyclones in the region in the latter half of the last century and the first two decades of the 21st century.

The north Indian Ocean region—which includes the Bay of Bengal, the Arabian Sea and the northern part of the Indian Ocean—is exposed to 6 per cent of the world's cyclones, according to a December 2020 pre-print paper submitted by Koll and Vineet Singh, a researcher at IITM, in the journal *Atmospheric and Oceanic Physics*. It notes that sea surface temperatures (SSTs) prior to cyclones in the Arabian Sea have been 1.2-1.4°C higher in the recent decades, compared to SSTs four decades ago. The report says: "Recent studies show that rapid warming in the north Indian Ocean associated with global ocean warming enhances the heat flux from the ocean to the atmosphere, and is fuelling a rapid intensification of these cyclones." For instance, explains Koll, during Amphan last year, SSTs in the Bay of Bengal were 32-33°C—one of the highest ever recorded in the region.

Circular ocean currents similar to whirlpools, known as eddies, also play a role in the intensification of cyclones, the paper observed. Eddies may be generated by winds or by density differences of the waters and can change the ocean's heat content. DTE

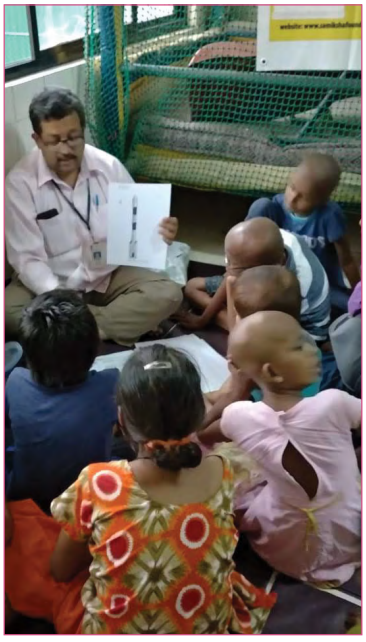
@down2earthindia

samiksha FOUNDATION
CARING for children with cancer

Himalaya SINCE 1930
90+ YEARS OF TRUST

# KNOWLEDGE SHARING
## TO ENSURE CONTINUOUS LEARNING







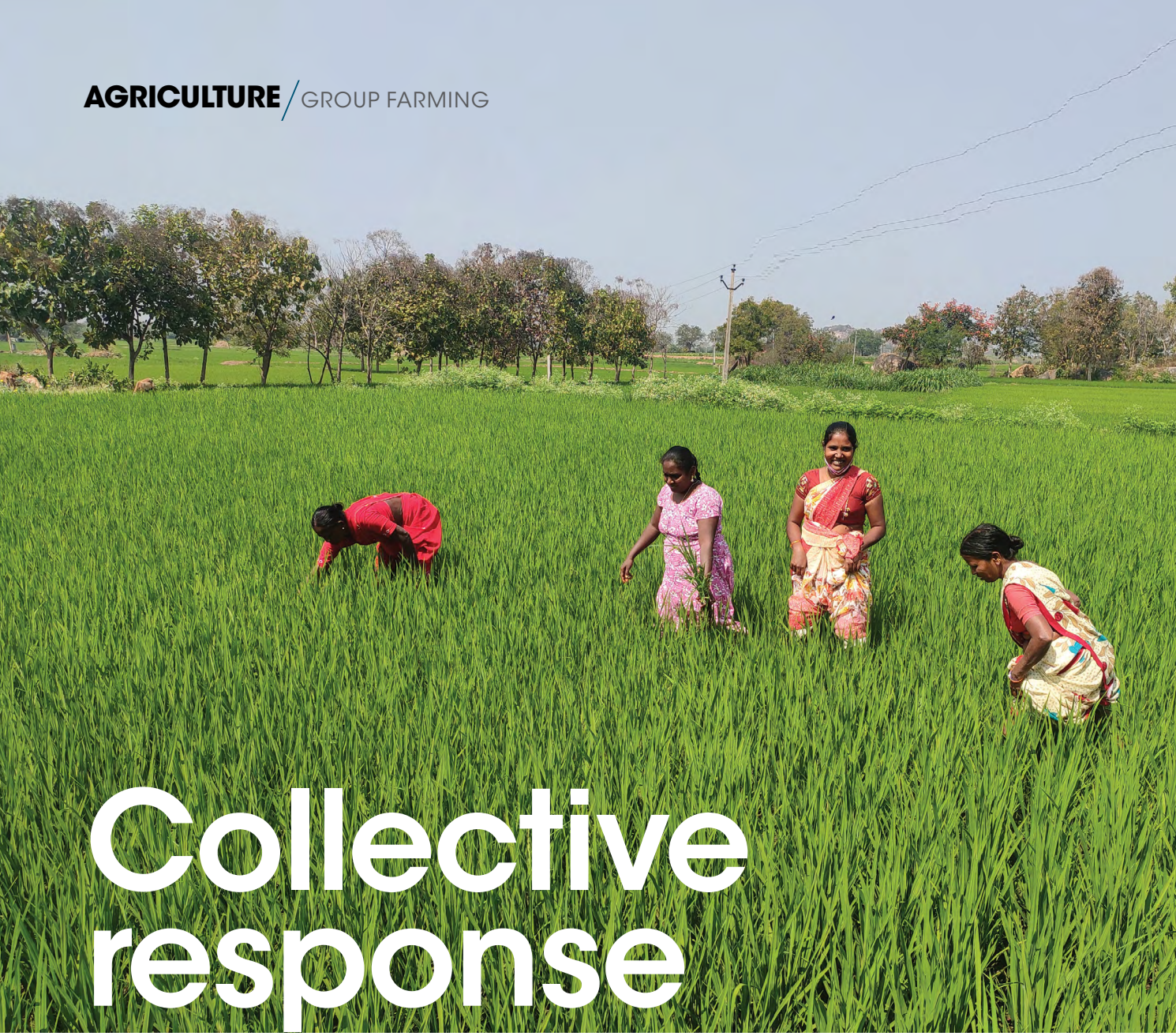
There is a 76% survival rate for children fighting cancer in India when they receive good medical treatment. But due to extensive treatment and chemotherapy sessions, these kids miss out on going to school or continuing their education. Providing educational support to these kids while they undergo treatment at the hospital boosts their morale and helps them return to school with dignity and confidence.

Himalaya is supporting Samiksha Foundation, a creative learning initiative for children with cancer and their caregivers. Samiksha has centers at the Kapur ward in Kidwai Memorial Institute and Mazumdar Shaw Cancer Center, Narayana Health, Bengaluru.

The initiative focuses at motivating these children by providing them with educational, creative, and spiritual support while they undergo treatment. As part of the curriculum, the children are taught yoga, meditation, art, and have access to a multilingual library with a plethora of books. Storytelling sessions are also conducted to make these knowledge-sharing activities more engaging and are very popular among the children at the hospitals.

Himalaya has been actively associated with Samiksha Foundation from 2016 and has supported around 1800 children so far. Children getting admitted to these hospitals for cancer treatment can enroll with Samiksha and avail all the facilities provided to help them continue with their education.

Himalaya has always been committed to addressing primary and community healthcare challenges. Through initiatives such as comprehensive community health camps, we have strived to take care of the basic healthcare needs of socially and economically marginalized groups. We have also worked towards spreading awareness about menstrual hygiene management, WASH (Water, Sanitation and Hygiene), CHD (Congenital Heart Disease), zero hunger, and cleft-lip treatment.



# Collective response

Small and landless farmers join hands to survive the pandemic, make group farming relevant again

**SHAGUN KAPIL**
KARIMNAGAR, TELANGANA

WHEN CHOUUDAMALLA Shamala was pregnant with her second child last year, she knew her husband's salary of ₹8,000 a month was not going to be enough. So, she applied for a teaching job at the government school in Jagiripali village of Telangana's Karimnagar district. Soon after, the national lockdown was imposed to curb the spread of COVID-19 infection and the school was closed.

A few months later, her husband, who works at the village *panchayat* office, faced a salary cut due to the pandemic. "Despite being pregnant, I contemplated applying for works under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)," says the 26-year-old. It was then that she heard about an all-women farming group or *sangha* being set up in the village by Hyderabad-based non-profit Bhumika Women's Collective. She immediately signed up.

The group of 10 women took 1 hectare (ha) of farmland on lease last December and started growing paddy. They harvested their first crop on May 10 and are now in the

PHOTOGRAPH: SHAGUN KAPIL / CSE



Jaya, Chouudamalla Shamala, S Balava and K Lakshmi of Jagirpali village in Telangana's Karimnagar district. They belong to the village's all-women farming group set up by non-profit Bhumika Women's Collective

process of selling it. "We will make a good profit even if the paddy sells at the minimum support price set by the government," says Shamala.

Bhumika Women's Collective has helped at least 200 small and landless women farmers in Karimnagar and neighbouring Siddipet districts to start group farming during the pandemic. It has provided ₹50,000 as one-time funding to 20 women's groups in the state.

Group farming has also benefitted women farmers in Kerala. There were over 30,000 all-women group farms in the state cultivating in March 2020 and 87 per cent of them economically survived the pandemic, says Bina Agarwal, professor of development economics who has closely researched and documented group farming in the country for over a decade. The groups were able to sell their produce, especially fruits and vegetables, locally or to the community kitchens run by the state government under its poverty eradication mission, Kudumbashree. "In contrast many individual male farmers suffered losses," says Agarwal.

"In Gujarat, 16 all-women group farms were formed after I conducted a workshop there in August 2018. They are now food secure amid the pandemic, whereas several individual farmers have lost out because of labour and sale bottlenecks," she adds. There are similar initiatives in Gujarat facilitated by other organisations (see 'Women's groups help...' on *p*24).

Agarwal cites similar success stories for Bihar where the higher wheat yields of farmers' collectives provided the members enough grains for subsistence during the crisis, while individual farmers were dependent on a less reliable public distribution system.

## MUCH-NEEDED CUSHION

"Two years ago I borrowed ₹50,000 for farming but I lost the entire crop. I felt so bad that I didn't eat food for three days," says 45-year-old Jaya, the only member in Shamala's group in Telangana who owns a piece of land. In a group, the risks are divided. This is important as rains are erratic and irrigation is non-existent in the region, she explains. "Even if we suffer a loss in this crop, we can tide over it and return loans we may have taken collectively." The yield also goes up because group farms can afford tractors, pesticides and fertilisers. "These are normally too expensive for a small farmer," she adds.

Jaya has leased 0.2 ha to the *sangha* for ₹20,000. She will get an additional ₹6,100 as her share in the profit made by the group. Of this, ₹4,650 will be in cash and the remaining in paddy bags. She will also receive ₹600 a day for the labour that she put in during the cultivation period.

While the *sangha* grew paddy in the first year because of the assured minimum support price and good rains, they are open to diversifying. "If the rains are good, we might continue with paddy, if not, we will go for groundnut, maize or millets," says Jaya. They are also exploring goat rearing in the future.

## OLD IDEA, NEW TWIST

The concept of group farming is not new to the country. Several states have in the past experimented with it but with limited success. While the initiative has worked well in Kerala, Bihar and parts of West Bengal, it has faltered in most other states, including Telangana (see 'If the government...' on *p*22).

"The latest initiatives in Telangana are different," says P Prasanthi, director, Bhumika Women's Collective. "Earlier, the size of the group was large (around 30). The women were working only for a few hours in the *sangha* while focusing more on their family land. The income was also lower as the

**THERE ARE OVER 30,000 ALL-WOMEN GROUP FARMS IN KERALA AND 87 PER CENT OF THEM ECONOMICALLY SURVIVED THE PANDEMIC**

# "If the government is serious, group farming can transform Indian agriculture"

**BINA AGARWAL,** professor, Development Economics and Environment at the University of Manchester, UK, says it can solve the production constraints of small farmers

**You have studied group farming for over 10 years. What benefits can it bring?**
Group farming involves voluntarily pooling land, labour and capital and cultivating in groups. This can help small farmers overcome their production constraints. The majority of Indian farms are too small to be economically viable. Some 86 per cent of farmers cultivate under 2 hectares, in fragments. Most lack access to irrigation, bank credit, technologies and information, and bargaining power in markets. A large proportion are women.

Group farming can provide an institutional solution. Farmers would enjoy economies of scale, have more investable funds and skills, reduce input costs, and address climate change. Women can gain independent identities as farmers. My research, which has also catalysed new experiments in India and Nepal, demonstrates this. Most groups also survived economically under the 2020 COVID-19 national lockdown, while most individual farmers incurred losses.

**Can it also be practiced on leased land?**
Absolutely. In Kerala, group farming is based largely on land leasing. The state government began promoting all-women group farms in the early 2000s, under its poverty eradication mission, Kudumbashree. Today there are over 68,000 such farms. In Telangana, a smaller experiment to form 500 group farms was tried by the UN Development Programme (UNDP) in 2001 in collaboration with the Centre and implemented by a quasi-NGO, Andhra Pradesh Mahila Samatha Society (APMSS). Here too all-women groups



depended mainly on leased land, since few women own land. In Bihar and North Bengal, however, you find all-male and mixed-gender groups. Here the men often pool their own land.

**You studied group farming rigorously in Kerala and Telangana. What did you find?**
I organised a meticulous collection of weekly data for every input and output, crop and plot, for a full year in 2012-13. The data covered 250 group and individual farms in two districts of Kerala and 763 farms in three districts of Telangana.

In Kerala, I found group farms had achieved 1.8 times the annual value of output per hectare and five times the net returns per farm relative to the individual farms (95 per cent of which were male managed). In Telangana, the group farms did worse than individual farms in terms of productivity but equally well on net returns, since they saved on hired labour. In both states, group farming empowered women socially and politically.

**Why did Kerala perform better?**
Kerala's groups received technical training and support from the Kudumbashree Mission. They were connected through registered *panchayat*-level community development societies which gave them local negotiating power. Their small groups of 5-6 members are appropriate for cooperation and for getting subsidised credit from NABARD. The members are literate; caste-heterogeneity enlarges their social networks and access to leased land; and commercial cropping improves profits.

Telangana's groups lacked state support after the UNDP project ended in 2005, although support from APMSS continued. The groups were too large (22 members on average) and most members belonged to scheduled castes, which narrowed their social reach and land access. A focus on food grains without much irrigation led to low yields. Basically, Telangana added group farming to an existing social empowerment programme while Kerala designed theirs for livelihood enhancement.

**How has group farming performed in Bihar and West Bengal?**
Here group farming was influenced by my writings. Exciting models have emerged with varying gender composition. Some cultivate collectively throughout the year, others for one season or crop. The farmers pool contiguous plots which enable efficient irrigation. All the collectives report higher crop yields than individual farms. In Bihar, those leasing land have negotiated lower rents from powerful landlords. That group farming can work in feudal contexts

demonstrates the replicability of the basic model.

**What can enable wider replication?**
Farmers need technical support and performance incentives from the government; a local NGO to guide them as they gain experience, at least initially; small group size; some social heterogeneity among members; and crops suited to local ecology, including commercial crops.

**Do farmer producer organisations (FPOs) differ from group farms?**
FPOs mainly do joint marketing of output and sometimes bulk input purchase. They rarely undertake joint cultivation, with farmers pooling land and labour. However, group farms and FPOs could serve complementary functions if clusters of group farms formed an FPO.

**Why is the government reluctant to promote group farming?**
First, it is preoccupied with agricultural marketing, paying little attention to the production constraints that small farmers face, or to institutional innovations. Second, it is sceptical due to failed experiments in group farming in the 1960s, without analysing why those failed. Basically, they used a flawed model, pushing small and large farmers (who have conflicting interests) to cooperate. There was little understanding of institutional design.

Today's group farming programmes have adapted the successful Self-Help Group model which has worked for savings and credit. This is based on principles of voluntariness, small group size, and egalitarian relationships. If the government were to seriously support group farming, it could institutionally transform Indian agriculture and farmers' livelihoods.

produce was distributed among all the women in the *sangha*," says Prasanthi. In the current model, the group size has been reduced to 10 making it more manageable. The women now view the collective work as their primary source of income, she says. The model also has a provision for the *sangha* to retain 5 per cent of its profits so the initiative remains financially sustainable.

In Goa, a modified version of group farming is helping people return to agriculture during the pandemic. "Over 95 per cent of the farmers in the state are small and marginal. Over the generations, this land got further divided and a major share of the land is now uncultivable," says Nevil Alphonso, state agriculture director. So the state government decided to roll out a programme in 2018 where farmers could collectively create irrigation facilities or carry out farm fencing and receive a one-time subsidy worth ₹2.5 lakh per hectare for the same.

**FARMING ACTIVITY IN SOUTH GOA'S SALCETE *TALUKA* HAS INCREASED BY ABOUT 20 PER CENT AND AROUND 25 HECTARES OF FALLOW LAND IS BEING CULTIVATED DURING THE PANDEMIC**

What sets the model apart is the fact that while farmers have to collectively create the assets, they do not need to farm together. The reason, says Shariff Furtado, zonal officer, Salcete *taluka* in South Goa, is that the state already provides a lot of incentives to individual farmers, making it lucrative.

The first group of farmers in Salcete *taluka* received the incentive money in November 2020 and the impact is already visible. Stray cattle often enter farms and destroy crops. This can be avoided through fencing, but it is too expensive for most small farmers. "Many people have returned to villages and are resuming farming because of collectively built affordable fences," says Furtado. As per government records, farming activity in the *taluka* has risen by about 20 per cent and around 20-25 ha of land has been reclaimed for farming since last November.

The state has another interesting variation where entire villages collectively hire modern expensive machines like harvesters on rent to work on individual fields. This practice was first put into action in 2015, when the residents of St Estevam village decided to stop a builder from developing a piece of fallow land in the village into a carriageway to transport coal. The 200-odd residents formed the Ilha Verde Farmer's Club and jointly cultivated paddy and turned around 45 ha of fallow paddy fields arable. The group took help from Father George Quadros of Don Bosco Society, who had been experimenting with mechanised farming since the 1980s. Currently 1,000 farmers across 25 villages hire the machines in a group.

"Farm mechanisation is costly, but can reduce farming cost by 60 per cent when used over large areas," says Furtado. Now when a machine reaches a village, it does not work on a single farm, but over 20 to 25 small farms. Such collective benefits are at the heart of group farming. DTE

@shagun_kapil

# 'WOMEN'S GROUPS HELP FARMERS ASK FOR ENTITLEMENTS'

Women farmers lose out on beneficial schemes due to poor representation. Cooperatives can empower them



**SALONIE MURALIDHARA HIRIYUR**



**NIKITA CHETTRI**



**RIYA KOTHARI**

**In 2009,** Lataben, an agricultural labourer in south Gujarat's Tapi district, noted that the people in her village were unable to access welfare schemes like MGNREGA. With support from the Self-Employed Women's Association (SEWA), a trade union that works for women's rights, she and others joined to demand their entitlements. This collective action enabled the formation of *Megha Mandli*—a cooperative of 1,000 indigenous women farmers. Lataben is now the president of this profitable cooperative. Supported by SEWA Cooperative Federation, which aids interventions of SEWA's cooperatives, *Megha Mandli* provides a platform for women farmers to pool resources and create linkages with social protection and the market—an integrated approach.

Despite a high contribution of 55-66 per cent to agricultural production, women farmers often struggle to establish their identity as workers, which hinders their access to resources. The National Policy for Farmers, 2007 has a broad definition of farmer to include landless farmers. However, the agriculture census only records the number of operational agriculture land-holdings. Further, government benefits for farmers require submission of land title records. This has adverse impacts, especially on women farmers since they seldom own land titles. The National Council of Applied Economic Research's study from 2018 reveals even though 42 per cent of the agricultural labour force in India are women, they own less than 2 per cent farmland.

Women farmers work under precarious conditions without child care, insurance, healthcare, maternity benefits, among other things. A study by the Federation in Tapi district of Gujarat says 90 per cent of women who listed agriculture as their primary job included cooking, cleaning and caretaking as their main activities outside this work. There is no substantial record for this unpaid labour.

In this regard, cooperatives ]empower women farmers to ask for their collective entitlements. This leads to improved livelihoods and access to social security.

One of the biggest challenges for farmers in Tapi district was a drop in yield due to high dependence on chemical-based fertilisers and pesticides. To remedy this, *Megha Mandli* adopted a two-fold approach of building awareness and capacity. To create local markets and promote organic farming, the cooperative provided early-stage financial support to initiate organic farming and vermicompost. This created a group of village-level agri-entrepreneurs. These members carry out sales of organic inputs—creating additional income as well as a local market with affordable prices. During the 2020 lockdown, the cooperative and members faced huge losses despite agriculture designated as essential. *Megha Mandli* was quick to adapt and provide relief to members.

There is still a long way to go. In the backdrop of the new agricultural laws (coupled with farmers' distress) and the double-whammy of health and economic loss caused by COVID-19, the Union Budget for 2021-22 was significant. But it missed the opportunity to include gender budgeting or support for farmer collectives. What is needed is a process for women to register themselves as farmers with the local government. Such a record will expand the outreach and benefits of programmes and help develop targeted schemes. Cooperatives like *Megha Mandli* and farmer producer organisations can help provide information for registration.

*(Salonie Muralidhara Hiriyur is Senior Coordinator, Nikita Chettri is Research Associate and Riya Kothari is Policy Intern at SEWA Cooperative Federation)*

Har Ghar Jal
Jal Jeevan Mission

# WATER QUALITY MONITORING AND SURVEILLANCE-CASE STUDY OF KARNATAKA

JALOTSAVA
MANE MANEGE GANGE

The **United Nations General Assembly** has recognized the significance of "Right to safe and clean drinking water, sanitation" as essential for life. The **Niti Aayog** June 2018 report, declared that 600 million people in India face high to extreme water stress in the country. About three-fourth of the households in the country do not have drinking water at their premises. With nearly 70% of water being contaminated, India is placed at 120th amongst 122 countries in the water quality index". About 2,00,000 people die every year mainly due to inadequate access to safe water, leading to water borne diseases such as typhoid, cholera, dysenteries etc. A year after the alarming Niti Aayog report, the Central Government announced the formation of **Ministry of Jal Shakti** by merging Ministry of Water Resources, River Development & Ganga Rejuvenation and Ministry of Drinking Water and Sanitation for an integrated approach to water conservation and management. The Ministry launched **Jal Jeevan Mission**, the Flagship programme of the Prime Minister on 15th August 2019 with an aim to provide functional household tap connection to every Rural household by 2024, under which utmost importance is given to water quality monitoring. The Ministry of Jal Shakti in March 2021 has launched a framework and guidelines for testing, monitoring and surveillance of drinking water quality as well as **Water Quality Management Information System (WQMIS)**, an online portal that provides detailed information for this purpose.

Groundwater quality depends on multiple factors and is a dynamic one; hence, there is a need to constantly monitor it. Water quality testing is important for monitoring the operation of water supply works, investigation of disease outbreaks, selection of appropriate water purification technology to be adopted and its validation. As per JJM, the States have to establish **multi-level water testing mechanism** for the chemical parameters to be tested once a year and bacteriological twice a year (pre and post monsoon).



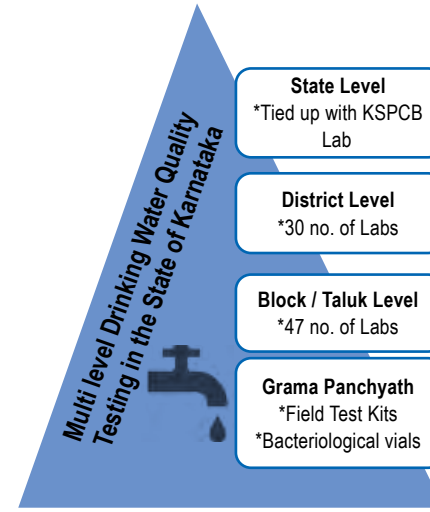


**Parameters Tested at RDW&SD Water Quality Testing Laboratories established by, Government of Karnataka**

| Sl. No | Parameters | Acceptable limit | Permissible limit |
|---|---|---|---|
| 1. | Colour (Hazen units) | 5 | 15 |
| 2. | Turbidity, (NTU) | 1 | 5 |
| 3. | Total Dissolved solids, mg/L | 500 | 2000 |
| 4. | pH | 6.5-8.5 | No relaxation |
| 5. | Alkalinity (as $CaCo_3$), mg/L | 200 | 600 |
| 6. | Total Hardness ($CaCo_3$), mg/L | 200 | 600 |
| 7. | Chloride (as Cl), mg/L | 250 | 1000 |
| 8. | Calcium (as Ca), mg/L | 75 | 200 |
| 9. | Magnesium (as Mg), mg/L | 30 | 100 |
| 10. | Fluoride (as F), mg/L | 1 | 1.5 |
| 11. | Sulphate (as $So_4$), mg/L | 200 | 400 |
| 12. | Nitrate (as $No_3$), mg/L | 45 | No relaxation |
| 13. | Iron (as Fe), mg/L | 1 | No relaxation |

**Water Quality Monitoring and Surveillance Mechanism in Karnataka**

**Rural Drinking Water and Sanitation Department, Government of Karnataka** has established a multi-layer water testing mechanism covering the entire State. The State has 30 District labs and 47 Sub-Division labs and has tied up with KSPCB for detail lab testing of **13 parameters** while presumptive water testing is undertaken by the community at Gram Panchayat level using field test kits and bacteriological vials. The Department intends to test around 1,20,000 sources every year. The water samples are collected by the sample collectors by using **Time stamp and Geo stamp mobile application**. RDWSD has also fixed a nominal rate of water quality testing for the public. NABL accreditation is also being taken up for the laboratories in a phase wise manner.




**Monitoring & Surveillance**

**Monitoring** is done by the Quality managers and Executive Engineers at the Districts and WQMS team at State Office through regular reviews, VCs, field visits, audits. **Surveillance** of the drinking water sources from the public health point of view is carried out by the rural community of Gram Panchayats.

**Human resources development**

RDWSD, GoK, headed by Commissioner, has a team of technical experts for WQMS vertical. It is managed by Chief Engineer and assisted by State Technical Coordinator and other Consultants at the State level. The laboratories staff includes Quality Managers, Analyst, Sample cell in-charge, Microbiologist, and water sample collectors.

The Executive Engineers and Lab in-charge are oriented on water quality monitoring and surveillance while Quality Managers are trained on ISO 17025:2017. **Capacity building** of lab personnel is carried out through induction and on job training. Standard Operating Procedures, Quality Manual Management System Procedures and documentation formats are being maintained in labs. The water quality results are updated timely on Integrated Management Information system (IMIS)/ Water Quality Management Information System (WQMIS) portals of GoI.

**Outreach**

Awareness on water quality to general public is provided by Implementation Support Agencies (ISAs) which are empanelled at District level. **Video documentation** on water quality analysis (English and Kannada versions) has been prepared and disseminated. **Training** is provided to grass root level workers (like Asha, Anganawadi workers, NGO workers & Teachers who are a part of VWSC) on presumptive water quality testing. 26,000 VWSCs are established, and 10,922 women have been trained.

The water quality monitoring, surveillance and outreach activities in rural areas have brought the public and the administration on a common platform for conserving the precious resource: **'Water'.**



# Second coming

Revival of the Odi river has helped villages double their agricultural yield in a drought-prone Bundelkhand district

**BHAGIRATH** LALITPUR, UTTAR PRADESH

"AS YOUNGSTERS, we used to dive in its deep waters from tree tops. Over the years, it receded and then disappeared completely. It is quite remarkable that the river is now back in all its glory," says 59-year-old Atar Singh, a farmer from Gora Khurd village in Uttar Pradesh's Lalitpur district.

The Odi, a non-perennial rain-fed river, once ran a 20-km stretch from Madanpur village on the southern edge of Lalitpur, to the Jamni dam, providing water to

PHOTOGRAPHS: BHAGIRATH, BUNDELKHAND SEVA SANSTHAN



(Right) The Odi river started drying up in the 1990s and completely vanished by 2000; (Left) The river has been revived and, in March 2021, is still full of water it received during the 2020 monsoon -

seven villages on either side of its banks (see 'Brought to life', *p*28). The river's main source was the Madansagar pond believed to have been built around 10th century under the Chandela dynasty. The pond is still there, but the river began to dry up in the 1990s after the government built 10 check dams to hold its water, and completely dried out by 2000. Due to poor maintenance, the check dams got filled with 1.5-2 m of silt, which made the river extremely shallow and the waters would not hold, says Singh. The annual average rain of 800 mm in the chronically drought-prone region of Bundelkhand, too, did not help matters. With the river drying up, the water table of the area dropped—wells and hand pumps went dry, and the villages faced severe water scarcity.

**ODI'S REVIVAL HAS RESULTED IN ₹9.73 CRORE ADDITIONAL INCOME FOR 3,500 FARMING FAMILIES IN SURROUNDING VILLAGES—11 TIMES THE INITIAL ₹87 LAKH INVESTED IN REJUVENATION WORKS**

"The story of Odi's rejuvenation began in 2017, when the then district magistrate Manvendra Singh took a keen interest in it," recalls Vasudev Singh of Bundelkhand Sewa Sansthan (BSS), a non-profit based in Lalitpur, who was also actively involved in the revival of the river. The district magistrate ordered a survey of the area across the length and breadth of the river, and the findings indicated that desilting the check dams and dredging the riverbed would help in Odi's rejuvenation. Manvendra Singh then asked the irrigation department to make a detailed plan for revival.

"We also consulted Rajasthan-based water conservationist and Magsaysay awardee Rajendra Singh, who suggested that the revival plan be implemented under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) to ensure 100 days of guaranteed paid work in rural areas," says Vasudev Singh. Once the plan was approved by the district administration, BSS spread awareness to ensure public participation under MGNREGA.

The first of the three-step revival plan involved removal of silt from the check dams. Next, the engineers identified 42 points across the length of the Odi—at Madanpur, Didoniya, Pahadi Kalan and Hasera villages—for

increasing the depth of the river. Of these, 33 points were dug up in April-June 2018, while nine were dug in March 2019. The depth was also increased at five additional spots, taking the total number of such points to 47.

In the third step, silt collected from the check dams was used to build embankments. Around 25,000 plants were grown along the embankment to check rain-water runoff.

Vasudev Singh says the revival works were carried out with a budget of ₹87 lakh—₹23 lakh from *gram panchayat* funds and ₹64 lakh as wages under MGNREGA. The work provided waged employment to 558 families.

The results became evident within months and were quite astonishing. After the 2019 monsoon, the river, for the first time in 20 years, filled to the brim with water. Barring Madanpur and Darutala villages, which are at a relatively higher altitude, all the other villages on the river's path now have water throughout the year, unlike the 1990s when it was available for only five months around the monsoon. Downstream, the Odi now also recharges some 250 wells. When *Down To Earth* visited Lalitpur in March 2021, the river still had water from the rains it received last year.

## GOOD FORTUNES

The Odi's revival immediately improved the lives and livelihoods of 3,500 families in the six villages, shows BSS data. The river irrigates nearly 3,885 hectares (ha) and 283 ha of barren land has been made fertile, as per data with the district administration. Yields, too, have improved drastically. Before the river's revival, Lalitpur grew an average of 1.5 tonnes of wheat per ha. This has now increased to 3 tonnes per ha, as per BSS. Similarly, black gram (*chana*) yield has risen to 18 tonnes from 1.2 tonnes per ha, while peas and lentil (*masur*) production is up by 50 per cent.

Water availability has also resulted in farmers taking up double cropping, which is now practised on 2,428 ha, shows district administration data. "The excess water and yields have encouraged farmers to grow both kharif and rabi crops," says Urmila Saharia, a farmer from Pahari Khurd. Some farmers, like Rajendra Singh of Didoniya village, whose 3.2 ha land is wholly irrigated by the Odi, are taking up cultivation of water-intensive crops like vegetables. "I am considering growing potatoes," he says.

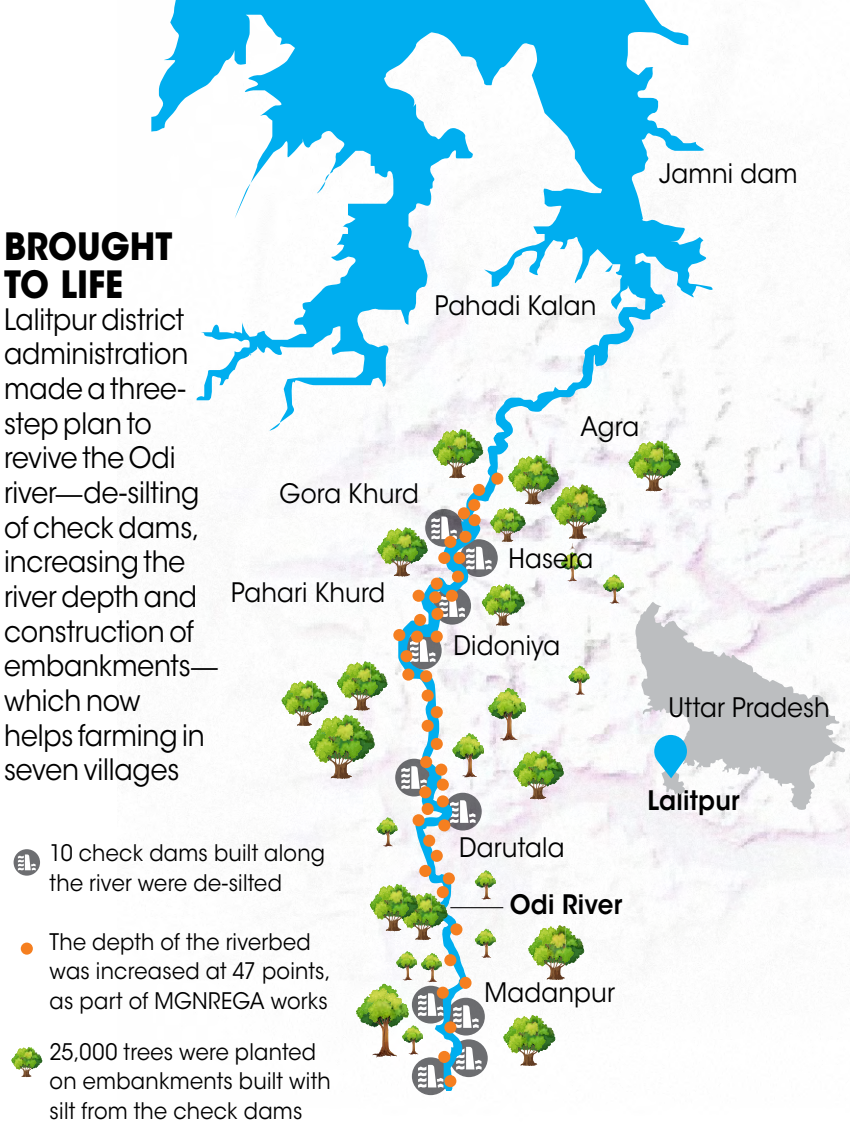
The increased yield has raised the average income of a farming family to ₹68,000 from ₹40,200 a year, says Vasudev Singh, on the basis of BSS data. For 3,500 families, this means an additional income of ₹9.73 crore a year—11 times the ₹87 lakh invested for the revival of the Odi. In recognition of his efforts, the district magistrate received National Water Award in 2019.

"Odi's example has shown that if the local administration and people collaborate to revive more rivers and streams in Bundelkhand, the region can end its water scarcity," says Vasudev Singh. DTE

@down2earthindia

## BROUGHT TO LIFE

Lalitpur district administration made a three-step plan to revive the Odi river—de-silting of check dams, increasing the river depth and construction of embankments—which now helps farming in seven villages



# SUSTAINABLE CONSERVATION OF NATURAL RESOURCES

## BY SRINIVASAN SERVICES TRUST, THE CSR ARM OF TVS MOTOR COMPANY




### ACTIVITIES

- Participatory desilting and strengthening of embankments in minor irrigation tanks.
- Participatory planting of trees in community and private lands.

### RESULTS

- Enhancement of water holding capacity to 1387 million litres through desilting 272 MI tanks.
- Sequestering and fixing carbon to a tune of 1274 tonnes by planting 6.40 lakhs tree in community & private land in last five years in addition to economic benefits.

TVS



COVID-19 SECOND WAVE

# NO RURAL SAFETY NET THIS YEAR

## COVID-19 has reached the hinterland and is likely to hit rural India to an extent that it will not be able to hold up the country's economy like it did last year

**BY PRONAB SEN**

THE PANDEMIC has spread really fast across rural India this time. During the first wave last year, rural areas were not as severely affected. Most rural activities, both agrarian and non-agrarian, continued quite smoothly. Farmers harvested bumper rabi crops, which are usually cash crops, and were able to market them smoothly. Problems did crop up a little later, after the rabi harvest, when farmers took up inter-harvest crops (short-season crops between kharif and rabi). Amid the nationwide lockdown, they suffered losses due to restricted transportation and marketing of these crops, which are essentially horticultural produce and have a short shelf life. Due to reverse migration, some states like Punjab faced labour shortage. But the impact was limited and was not felt across the country; South India was pretty much spared. The kharif season, too, went very well.

This year also, the rabi foodgrain production has been good, and the crops have been, by and large, marketed. I am rather concerned about the inter-harvest crops, which are sown in April, and kharif crops, whose sowing is about to begin. With COVID-19 spreading really fast across rural India,

PHOTOGRAPH: REUTERS

availability of labour may soon become a serious concern and productivity may not remain at last year's level. Maybe farmers will manage to sow the crops, but the productivity is still likely to drop sharply.

Non-agricultural rural activities (such as carpentry, construction and cycle repair) are going to experience a lot of damage since these require close human contact. The sectors that did relatively well last year on the basis of rural demand, mainly the fast-moving consumer goods sector, are not going to do that well this time. The extent of the damage, however, depends on how quickly the fear of the pandemic spreads and grips rural India. This time, the fear levels are much higher, particularly in rural India where medical facilities are not adequate. If the fear factor becomes strong and persistent, then the damage is going to be substantial. So we should not expect rural India to hold up the Indian economy the way it did last year (when the agriculture sector kept the rest of the economy buoyant). This is the real problem.

The national lockdown, imposed last year to curb the spread of the COVID-19 infection, lasted for a little over two months. All economic activities, other than essential services, remained suspended during the period. This time around, it is not the case. Now, that sounds a lot better. Unfortunately, this time the uncertainty about the lockdown is huge.

Last time, the damage was large but limited for a fixed period. Economic activities bounced back very quickly as soon as lockdown restrictions were eased. This time, the damage is going to be partial, but will continue for a longer period. Think of an integrated production system or a transportation system, in which people need to plan in advance. If you are not sure when the lockdown is going to be imposed and where, it leads to uncertainty and affects your decision making. This will have a rippling effect on investments, which will suffer.

As of now, we have plenty of food stocks and the delivery and food supply chains are working fine. But we do not know what's going to happen in the future as a lot depends on the production in post-rabi seasons. Horticulture products are definitely going to get severely hit. The sowing data will tell us how bad the situation is going to get.

The country's rural poverty is going to get worse. There are primarily three ways how COVID-19 is going to impact India's rural poverty. First, because of reverse migration, a lot of urban poverty is now being exported to rural areas. Last year, we saw a mass exodus of labourers from urban areas to their villages after the nationwide lockdown was announced. This year, it is not just the lockdown but also the fear of the virus that is driving a lot of workers back to their villages. The second way is the damage to horticultural crops and kharif crops. Many farm houses who used to employ landless labourers as farm hands may not do so this time, due to fear factors. This means a lot of landless labourers, who already are poor, are going to become poorer. The third reason is, a lot of non-agricultural activities, as I mentioned earlier, are going to be seriously impacted this time. Studies already show that rural salaried employment has fallen during the past one year of pandemic.

## INFLATIONARY IMPACT

Till a few weeks ago, I was not expecting such an acute spread of the pandemic in rural India. My fear at that time was only related to the supply chain. But now, there is a threat to production. The supply of food products (other than food

**AS OF NOW, WE HAVE PLENTY OF FOOD STOCKS AND THE DELIVERY AND FOOD SUPPLY CHAINS ARE WORKING FINE. BUT WE DO NOT KNOW WHAT'S GOING TO HAPPEN IN THE FUTURE AS A LOT DEPENDS ON THE PRODUCTION IN POST-RABI SEASONS. HORTICULTURE PRODUCTS ARE DEFINITELY GOING TO GET SEVERELY HIT. THE SOWING DATA WILL TELL US HOW BAD THE SITUATION IS GOING TO GET.**

grains) to urban India is going to be affected both due to supply chain disruption and rural production loss, which will very soon fuel inflation—food inflation in particular. India may also need to import items like vegetables. India has traditionally been the exporter of horticulture products like potatoes and onions.

This will also have huge disruptive effects on the global markets as first we will stop supplying to the international market; and then, we become a buyer. The rates in international markets are going to go through the roof.

## CORRECTIVE MEASURES

Some of the important measures introduced by the government last year were free food distribution, ₹500 cash transfer for three months for all women Jan Dhan account-holders and raising wages for works under the Mahatma Gandhi National Employment Guarantee Act (MGNREGA). Free ration under the public distribution system (PDS) should continue for long. Some studies show that cash transfer to vulnerable households through Jan Dhan accounts did help people; but it worked only to a limited extent. It is not a bad idea to continue with it, but since PDS has a better reach, it should be considered for such cash transfer.

Then comes MGNREGA. We know that the demand for MGNREGA works has gone up enormously. The question is once the MGNREGA sites start operating, will the fear factor prevent people from coming there? Will we be able to manage MGNREGA sites in a way that are COVID-appropriate? If no, then MGNREGA may not be able to support rural livelihood as effectively as it did last year.

In the immediate short-term, focus on making the supply chain work better. We know what went wrong last year—there was a total lack of clarity; there was total lack of coordination; at least fix that. This time, it can be done relatively quickly by focusing on two things. One, the Centre, state and local authorities should be on the same page on what is allowed and what is not allowed, and the message should go down to the law and order machinery in very clear, specific terms. It should also be made clear that any violation of these instructions will invite punishment.

COVID-19 is not India's first rural pandemic. Cholera was very much a rural pandemic. It took many lives and caused illnesses for a very long period of time. This was also true for typhoid. What is new about the current pandemic is that it is an airborne disease. Since the infection is spreading from person to person, the fear factor is much higher. It is also socially disruptive. Our long-term hope is vaccination. So far we have botched the process. But the quicker we roll out the vaccination, the better off we are, as it is the only way to address the fear factor.

*(As told to Snigdha Das)*

*(The author is an economist and former chief statistician of India)*

# TROUBLED INTERIORS

The second wave saw COVID-19 spread beyond urban centres, infecting rural and tribal populations. A report from the country's 16 severely hit districts on how the pandemic is unfolding in rural India

**RAJIT SENGUPTA,** NEW DELHI
**RANJU DODUM,** ITANAGAR
**ROHIT PRASHAR,** SHIMLA
**AAKRITI SRIVASTAVA,** BIKANER
**JUMANA SHAH,** AHMEDABAD
**RAKESH KUMAR MALVIYA,** BHOPAL
**ARVIND MOUDGIL AND DEEPANKAR DHOUNDIYAL,** PAURI GARHWAL
**ANAND DUTT,** GUMLA
**IMRAN KHAN,** MUZAFFARPUR **AND** WEST CHAMPARAN
**G RAM MOHAN,** ANANTAPUR
**BIJAY MISHRA,** ANGUL
**PURUSOTTAM THAKUR,** DHAMTARI
**K A SHAJI,** PALAKKAD
**VIVEK MISHRA,** MATHURA

ON MAY 4, the Odisha government was thrown into a tizzy after three people of the Bonda tribe tested positive for COVID-19. That the novel coronavirus would infect this tribal community, living in scattered hamlets in inaccessible forests, was beyond anybody's speculation. Identified by Census 2011 as one of India's 75 Particularly Vulnerable Tribal Groups, the Bondas are estimated to have arrived in the region some 60,000 years ago during the early human migration from Africa and have traditionally led a secluded lifestyle, residing atop forested hills in Malkangiri, the southernmost district of the state. Other than the occasional visit to local *haat*s (weekly rural markets) to sell their produce or barter it for minimal household essentials, their interaction with the outside world is extremely restricted. Officials suspect that the Bondas at Mudulipada village in the district contracted the disease at a nearby market in neighbouring Andhra Pradesh, which they visited since all rural markets in their own region had been shut as part of lockdown measures. The Odisha government has since sealed Malkangiri's borders with Andhra Pradesh and the local administration has restricted access to Bonda hamlets. Though the infected persons have been admitted to specialised hospitals in the district, the number of infected Bondas increased to 12 over the next week.

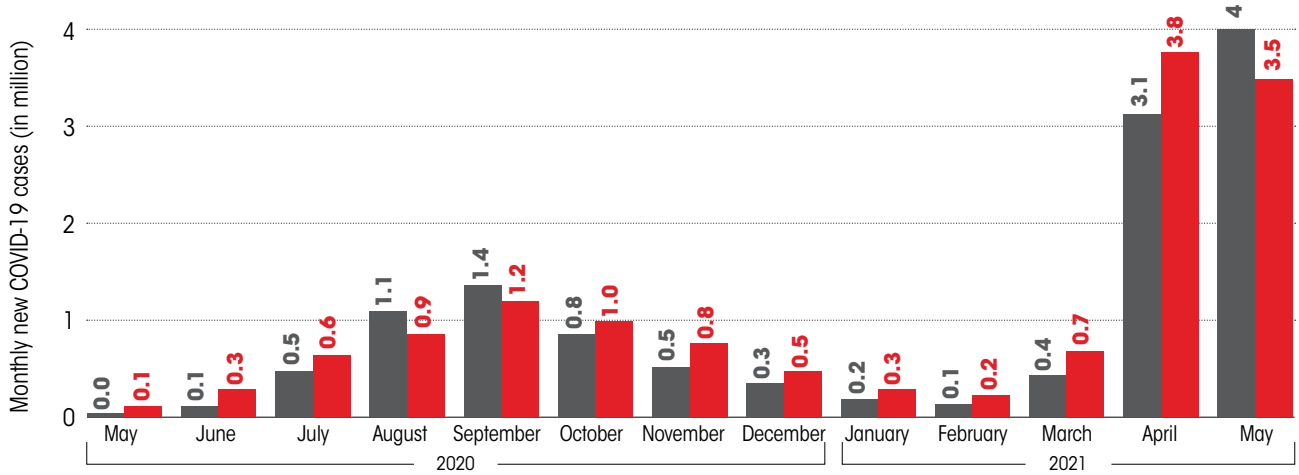
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# Spread to rural areas

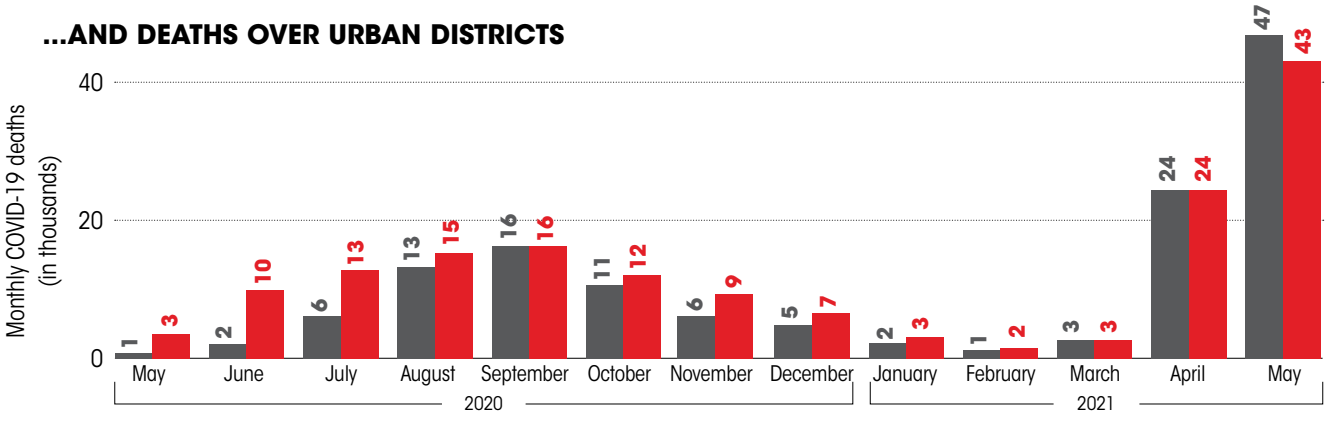
In May* 2021, India recorded 28.8% of its total COVID-19 cases and 31% of its total deaths

Rural Urban

**IN MAY, RURAL DISTRICTS RECORDED MORE NEW CASES ...**




**...AND DEATHS OVER URBAN DISTRICTS**




Source: How India Lives; Census 2011 and various district websites; Data as on May 23, 2021

The analysis is based on district-level numbers for all states / Union territories, though partial data is available for Andaman and Nicobar, Assam, Goa, Manipur and Telangana

Last year, as the news of indigenous communities getting affected by COVID-19 trickled in, the National Commission for Scheduled Tribes had asked the Odisha government to adopt special strategy for the Bonda tribe, saying that COVID-19 would be a threat to their "existence". The population of the tribe is either stagnant or, some say, on the decline.

COVID-19 breaching the hills of the Bondas marks the most worrying phase of the second wave, which has already made India the pandemic's global hotspot. In this phase, the virus is pervading the country much beyond urban agglomerations, sweeping across areas that are home to arguably the world's largest rural population of over half-a-billion.

May 2021 has been the most tragic month for the country in recent memory. Between May 1 and 26, India recorded 8.2 million new COVID-19 cases—the highest in a month since the first case was reported from Kerala in January

2020. In those 26 days, 103,382 people succumbed to the illness—this is more than double the lives the country lost in April and over a third of the country's total death count of 315,235 recorded since the outbreak of the pandemic. A *Down To Earth* (DTE) analysis shows that in those 26 days, India accounted for every other new COVID-19 case and every third death due to the infection recorded globally. What escaped everyone's notice is that every second new case and death reported from India in May was from the rural districts. This means every fourth case reported in the world that month was from rural India.

The pandemic's shift from urban to rural areas (see 'Spread to rural areas', *p*35) had, in fact, begun in April. That was the month when rural districts (where at least 60 per cent of the population live in rural areas) for the first time reported 3.1 million new cases, up from 0.4 million cases the month before. This was a little lower (by 0.6 million) than the number of cases that overwhelmed health systems and the sentiments of most people in urban districts. The number of deaths due to COVID-19, which stood at 5,600 in March, saw a significant increase to match the urban death toll of 24,000 in April. The numbers kept growing, and in May, outpaced those in urban districts. Rural districts accounted for 53 per cent of new cases and recorded 52 per cent of COVID-19 deaths (see 'Shifting geography', *p*36). This is a deviation from the overall trend from March 2020 to April 2021, when urban districts accounted for 52 per cent of new cases and 54 per cent of deaths.

The pandemic's shift from urban to rural areas is particularly evident in states worst-hit during the second wave. Rural districts in Maharashtra, for the first time in May, recorded more cases (61 per cent of the total new cases) than their urban counterparts; the state's rural share in April was 42 per cent. In Karnataka, the share of rural districts in May stood at 49 per cent, up from 32 per cent in April. In Uttar Pradesh, rural districts accounted for 68 per cent of the new cases in May, up from 57 per cent, and in West Bengal, the figures rose to 48 per cent in May from 43 per cent in April.

**In first 26 days of May, India accounted for every other new case of COVID-19 and every third death due to the infection recorded globally. That month, every second new case and death reported from India was from rural districts, meaning every fourth COVID-19 case reported in the world was from rural India**

The daily case count on the government dash board has, however, been on a downward trend since May 8—the last date when the country recorded more than 400,000 cases in a day. Does this mean the worst is over? No one is sure.

The weekly district-wise positivity rate report, till May 21, released by the Union Ministry of Health and Family Welfare indicates that more than half of India is still not testing enough and may miss new chains of transmission in the community. For the uninitiated, positivity rate is the percentage of people who test positive of all the tests done. A high positivity rate indicates that either the number of infected people in a community (positive tests) is too high or the number of total tests is too low. In either case, it suggests higher transmission and that there are likely more people with COVID-19 in the community who have not been tested yet. The World Health Organization recommends that the daily positivity rate be below 5 per cent for at least two weeks before the health measures are relaxed.

As per the ministry report, 382 of the 741 districts in the country continued to have a positivity rate higher than 10 per cent. Worse, 77 per cent of these districts were rural. Thirteen of the 15 districts with the highest positivity rates are also rural. Of the five districts with highest positivity rates, four are in Arunachal Pradesh—Changlang (96 per cent), East Kameng (80 per cent), Namsai (77 per cent) and Upper Subansiri (67 per cent).

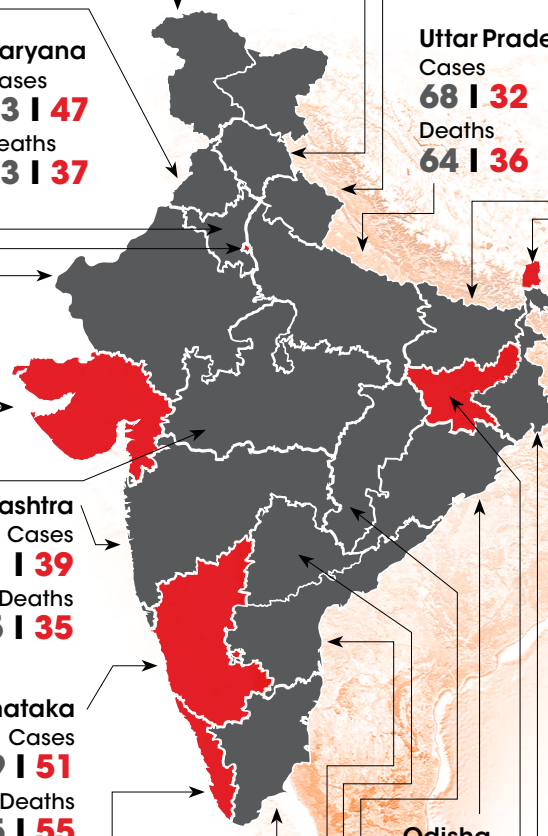
These are the areas now bracing for an explosion of cases. DTE reporters travelled to 16 districts with high COVID-19 positivity rate to understand how the pandemic is affecting rural India and how prepared the rural health infrastructure is to tackle the virus.

# SHIFTING GEOGRAPHY

In May, most states reported more cases and deaths in rural districts

**States with more** ■ Rural cases ■ Urban cases  % share of **00** rural and **00** urban cases,deaths in May

The analysis is based on district-level numbers for all states / Union territories, though partial data is available for Andaman and Nicobar, Assam, Goa, Manipur and Telangana.



**Jammu and Kashmir**
Cases 67 | 33
Deaths 49 | 51

**Himachal Pradesh**
Cases 100 | -
Deaths 100 | -

**Uttarakhand**
Cases 68 | 32
Deaths 55 | 45

**Punjab**
Cases 52 | 48
Deaths 59 | 41

**Delhi**
Cases 100 | -
Deaths 100 | -

**Haryana**
Cases 53 | 47
Deaths 63 | 37

**Uttar Pradesh**
Cases 68 | 32
Deaths 64 | 36

**Bihar**
Cases 83 | 17
Deaths 81 | 19

**Sikkim**
Cases 35 | 65
Deaths 9 | 91

**Rajasthan**
Cases 73 | 27
Deaths 67 | 33

**Arunachal Pradesh**
Cases 70 | 30
Deaths 67 | 33

**Gujarat**
Cases 33 | 67
Deaths 37 | 63

**Nagaland**
Cases 15 | 85
Deaths 9 | 91

**Madhya Pradesh**
Cases 56 | 44
Deaths 67 | 33

**Maharashtra**
Cases 61 | 39
Deaths 65 | 35

**Assam**
Cases 80 | 20
Deaths 72 | 28

**Manipur**
Cases 32 | 68
Deaths 29 | 71

**Tripura**
Cases 100 | -
Deaths 100 | -

**Mizoram**
Cases 5 | 95
Deaths - | 100

**Karnataka**
Cases 49 | 51
Deaths 45 | 55

**Meghalaya**
Cases 41 | 59
Deaths 19 | 81

**Odisha**
Cases 85 | 15
Deaths 82 | 18

**West Bengal**
Cases 48 | 52
Deaths 40 | 60

**Kerala**
Cases 25 | 75
Deaths 26 | 74

**Tamil Nadu**
Cases 19 | 81
Deaths 14 | 86

**Telangana**
Cases 54 | 46
Deaths - | -

**Chhattisgarh**
Cases 100 | -
Deaths 100 | -

**Jharkhand**
Cases 55 | 45
Deaths 36 | 64

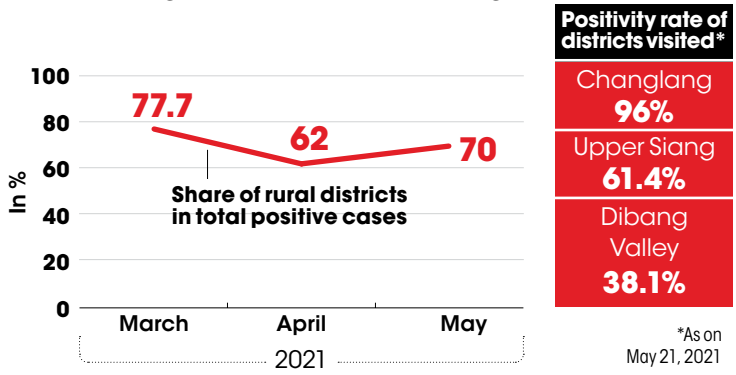
**Andhra Pradesh**
Cases 86 | 14
Deaths 82 | 18

Source: How India Lives; Census 2011 and various district websites; Data as on May 23, 2021
Rural districts are those with more than 60 per cent rural population; Analysis period is for May 1-23, 2021

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## ARUNACHAL PRADESH

### Dispersed settlements and poor telecom service make testing, vaccination a challenge




| Positivity rate of districts visited* |
|---|
| Changlang 96% |
| Upper Siang 61.4% |
| Dibang Valley 38.1% |

*As on May 21, 2021

Source: Union Ministry of Health and Family Welfare, How India Lives, Census 2011
Note: Rural districts are those where 60% of population lives in rural areas

For a state that had not reported a single instance of death due to COVID-19 complications for five straight months since early December 2020, except for a handful of cases during the period, a sudden surge in the numbers could be baffling. That's what happened when Changlang district recorded the country's highest positivity rate of 91.5 per cent in the first week of May. The officials quickly dismissed the report. Speaking to DTE, state health secretary P Parthiban says the figure was wrong and a letter had been sent to the Centre to rectify the information. On May 21, Changlang again topped the list of districts with high positivity rate.

Changlang's deputy commissioner, Devansh Yadav, cites a number of reasons for the high caseload in the district that shares an international border with Myanmar. "It is the second-most populous district after the capital region, which could be the reason for such a high caseload. Besides, we have a long porous border with Assam, which already has a high number of active COVID cases," Yadav says. Curbing the spread of the infection is a major challenge for his administration as, says Yadav, many people still think COVID-19 is a viral fever and are not willing to get themselves tested. Many also do not want to adhere to the protocols of wearing a mask and maintaining social distancing despite awareness campaigns at villages. Between April 2020 and May 2021, as many as 7,667 people across the state have been penalised for violating COVID-appropriate behaviour.

**Conducting testing and vaccination in Dibang valley is a challenge as the district has a population density of one person per sq km. Officials say it is easier to vaccinate a village of 100 than 10 villages with population of 10**

However, in a state that is home to at least 26 diverse tribes, each with its own specific prescribed lifestyle and spread across a topography that ranges from humid plains to alpine mountains, the reasons for the spread of the virus are equally varied. Upper Siang district, which is overlooked by the Himalayas and where the Tsangpo river enters India from Tibet (and is called the Siang) before eventually becoming the Brahmaputra, also recorded a high positivity rate of 61.4 per cent in the week preceding May 21. District medical officer, Dubom Bagra, says the most-affected villages are those of the Adi tribe. The communities recently celebrated Etor, an annual festival that marks fencing of farmland to protect crops from being raided by wild animals. As is customary, community gatherings and feasts were held and may have contributed to the spread of the virus.

In Dibang Valley, which reported a positivity rate of 38.1 per cent on May 21, district deputy commissioner Minga Sherpa attributes the increase in cases to the neighbouring district of Lower Dibang Valley that shares a boundary with Assam. "There is constant movement of people between the two districts. So sooner or later, any infection affecting Roing (headquarters of Lower Dibang Valley) will have an affect in Anini (headquarters of Dibang Valley)," he says. Conducting testing and vaccination is a challenge because Dibang Valley has a population density of one person per sq km. Reaching out to a large number of dispersed settlements is "human resource intensive". "It's easier to vaccinate a village of 100 than 10 villages with a population of 10," Sherpa says.

The challenges do not end there for

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# Online Training Programme on GIS and Remote Sensing for Designing & Implementing Green Infrastructure




**Part A (Online):** 23 June to 9 July 2021 | **Part B (Residential):** 28 - 30 July, 2021
**Language:** English | **Platforms:** Moodle and Zoom

## BACKGROUND

This tailor-made training on Geographic Information System (GIS) and Remote Sensing (RS) will go long way supporting practitioners as well as allow managers and regulators move efficiently from traditional planning and design techniques to smart, cost effective and sustainable water and sanitation solutions.

**GIS Package:** The course will be run on open-source GIS package, Quantum-GIS (Q-GIS).

## AIM

To equip practitioners, managers and regulators with state of art tools and techniques required for water sensitive urban design and planning.

## LEARNING OBJECTIVES

- Build skills to use GIS and RS in sustainable water management in city/region.
- Enhance understanding on various data portals: USGS Earth Explorer, Bhuvan, OpenStreetMap, Toposheets, etc.
- Prepare maps and perform analysis using open-source GIS packages for designing and implementing green infrastructure for improved water security in city/region.

**FOR REGISTRATION, PLEASE VISIT: bit.ly/3g6CZIG**

## PROGRAMME DESIGN

**Part A: Context setting and Introduction (Online Platform)** 23 June to 9 July, 2021

**Part B: Action Learning (Residential Training)** 28 - 30 July, 2021

GIS proficiency is not a requirement. However, participants must have basic proficiency in using of computers, and access to a computer system with minimum requirements for downloading, installing and running Q-GIS package.

## TRAINING FEE

₹3,500 (Indian Participants) US$ 100 (Participants from outside India)

'Free one year DTE subscription to participants who complete the course'

**Note:** Only shortlisted candidates will be informed.

## EXTERNAL TRAINERS



**Dr Pramod Kumar**
IIRS Dehradun, India



**Dr Nevil Quinn**
UWE Bristol, UK



**Mr Ujaval Gandhi**
Spatial Thoughts, India



**Prof. A. K. Gosain**
IIT Delhi, India



**Dr Sandhya Rao**
INRM Consultants, India

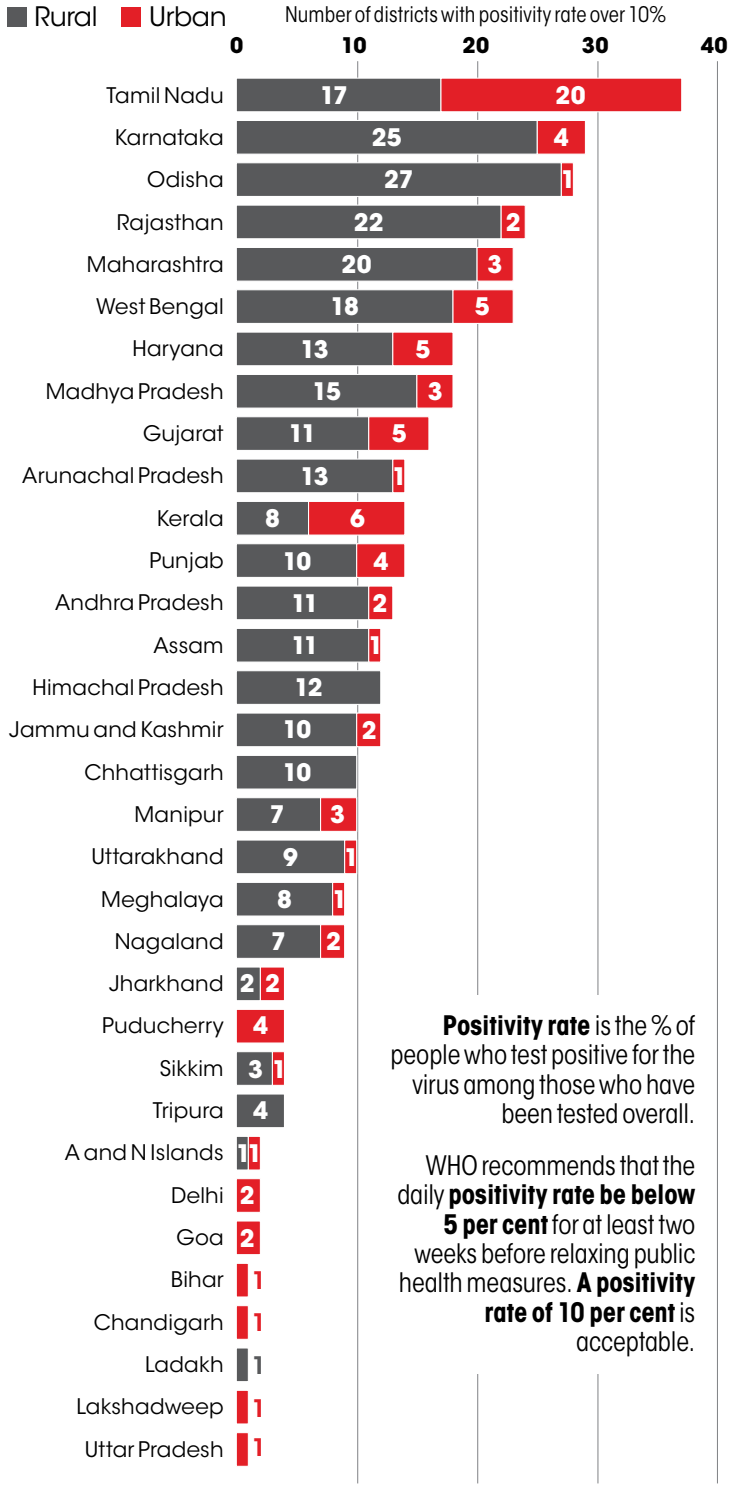
## FOR MORE INFORMATION, KINDLY CONTACT

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**Training Director, Dr Suresh Kumar Rohilla,** Senior Director & Academic Director, School of Water and Waste, Anil Agarwal Environment Training, Institute – AAETI, Email: srohilla@cseindia.org

# Ready to erupt

On May 21, 382 of 750 Indian districts had a positivity rate higher than 10 per cent. Of these, 77 per cent districts were rural




Source: Union Ministry of Health and Family Welfare; As on May 21, 2021

the rural districts of Arunachal Pradesh. Though the government had begun the third phase of vaccine rollout on May 17, after a delay of two weeks, many complained that they were unable to register on the *Cowin* portal due to poor telecom networks. The state in-charge for vaccination, Dimong Padung, says the Centre insists on online registration of those seeking to get vaccinated despite the state government citing the challenges. He suggests that a blended mode of offline and online registrations must be employed in the state to get people vaccinated.

## Food, fertilisers in short supply

More than COVID-19 or vaccines, people in the rural districts of Arunachal Pradesh are concerned about their livelihoods, which has been affected because of the lockdown and other COVID-related restrictions imposed by the state government. Kamin Pertin is the owner of a small general store in the semi-urban town of Mariyang in Upper Siang. The town is 350 km from the state capital of Itanagar and 80 km from Pasighat, the oldest town in the state. On the phone from Mariyang over a crackly network, Pertin tells DTE that businesses in the town have been allowed to operate only for one hour between 9 and 10 am. "Opening the shop, arranging the goods in the store, and eventually closing shaves off around 10 minutes. We are finally left with only around 40-50 minutes when we can actually sell anything," he says.

Stocking supplies for his store has also been made difficult. With the government limiting the number of people who can travel together in one vehicle, public transportation fares have increased. Pre-COVID, a trip to Pasighat to restock his supplies in a Tata Sumo taxi used to cost him ₹300. Now, he has to shell out ₹600 for a one-way trip. All these have slashed his earnings.

Like most people in the district,



PHOTOGRAPH: MINGA SHERPA

Pertin also grows rice as a subsistence farmer. But now that most of his family members have returned home because of the lockdown, the stored grain will not last them for long. Meat, an essential commodity for the indigenous people, is also in short supply.

Tea growers in much of eastern Arunachal Pradesh are undergoing a different experience. Near the village of Namphai Singpho in Changlang is the Lagao Tea Estate. Spread over 4 ha, it can be called a small tea garden when compared with the larger ones in the neighbouring Assam. Amitabh Guha who operates the garden on lease, supplies tea leaves to local buyers and even to a few from Assam.

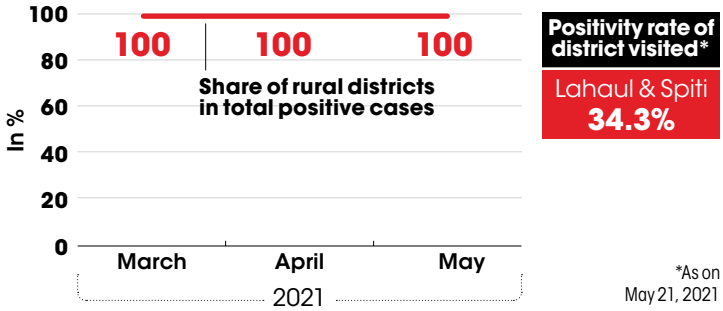
Like other tea growers, Guha depends on the skilled workforce brought from Assam, often referred to as "tea-tribes". Since the COVID-19 outbreak, travel restrictions have greatly affected movement between states. The Arunachal Pradesh government's decision to suspend the issuing of inner line permits, required by non-native people to enter the state, has added to the problem.

^ Arunachal Pradesh is home to at least 26 tribes, each with its own lifestyle and topographical spread, with many believing COVID-19 to be just another flu and so hesitating to get tested

Occasionally, restrictions are also placed on the movement of non-essential goods, says Guha, for which he is not able to buy weedicides and fungicides. The nearest place where the inputs are available is a commercial hub in Assam's Tinsukia, which is 120 km away, says Guha. "There seems to be an increased demand for tea during COVID-19. But I am not sure if I can benefit from it as long as the restrictions are in place, either in Arunachal Pradesh or in Assam."

## HIMACHAL PRADESH

**Farmers caught between life and livelihood as second wave coincides with the year's only farming season**




Source: Union Ministry of Health and Family Welfare, How India Lives, Census 2011
Note: Rural districts are those where 60% of population lives in rural areas. By this definition, all districts in Himachal Pradesh that recorded cases in March-May are rural

For almost six months a year, the tribal communities of Lahaul and Spiti valley remain isolated behind the Rohtang Pass as it gets covered with thick snow. Last year, their isolation was longer. After being shut for almost a year because of the pandemic, the cold desert mountain valley was all set to welcome tourists in February this year. The Spiti Tourism Society, travel agents, hoteliers and community leaders were jubilant because the recently inaugurated 9-km Atal tunnel, built to bypass the Rohtang Pass, had brought the high-altitude tribal valley closer to the rest the world and opened up new business opportunities for the residents. The district administration also set up guidelines to be followed by tourists visiting the valley. But the district, which had not reported a single COVID-19-related death and only a handful of new cases since December 2020, soon witnessed a sharp surge in numbers. On May 6, the administration imposed a curfew and closed the valley for tourists. The restrictions were in place till the magazine went to press on May 31.

Sham Azad, a social worker from Lahaul, says most people from the valley, particularly from Spiti, migrate to the plains during the harsh winter months and start returning around March. The virus could have travelled with them to the valley. "Since the district does not have a laboratory for testing, infections remain undiagnosed for days. The virus finds easy hosts as few in the valley adhere to COVID-19 protocols, like wearing mask and maintaining social distancing," says Sushil, acting president of the Young Drukpa Association Garsha, a non-profit engaged in welfare activities in the valley during the pandemic.

Ranjit Vaidya, chief medical officer, Lahaul and Spiti, offers another reason the virus has had a field day in the valley in the past two months. As soon as snow starts thawing in mid-April, the cold deserts become flush with vegetables, particularly with exotic ones like broccoli, lettuce, celery and coloured capsicum. Since farming work in the district is in full swing, some people avoid getting tested due to fear of losing work, Vikram says, adding that earnings from these crops are vital for people as the region's inhospitable climate allows only one cropping season.



Online registration has made vaccination a challenge for people in Lahaul and Spiti where phones or access to telecommunication is difficult

PHOTOGRAPH: ROHIT PRASHAR

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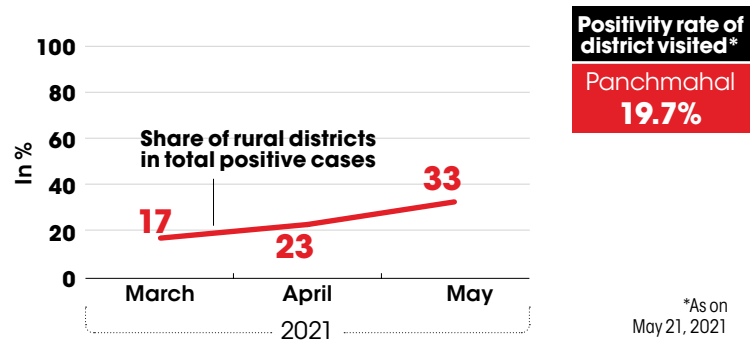
Vaccination, which needs registration on the *Cowin* portal, has also remained a challenge as people in the valley either do not have phones or access to telecommunication. The administration has demanded some changes in the *Cowin* portal for vaccination, and now 80 per cent of the people will be vaccinated offline and only 20 per cent of the youth will be vaccinated through the online portal.

The district administration has formed a Rapid Action Team for random sampling in every village. Those found COVID-positive with mild symptoms are advised home isolation and are given an isolation guide, paracetamol, sanitiser, multivitamins, calcium, zinc, and vitamin C on behalf of the administration. Those in need of oxygen are being admitted to hospitals. Since the district lacks surgeons, specialist doctors and modern health facilities, the district administration plans to airlift serious patients. On May 22, a kit distributed to patients by the chief minister, however, included a mask, thermometer, *chyawanprash* and some *ayurvedic* medicine.



## GUJARAT

**Amid a rapid surge in case numbers, communities face shortages of food, wage works and hospital beds**




Source: Union Ministry of Health and Family Welfare, How India Lives, Census 2011
Note: Rural districts are those where 60% of population lives in rural areas

Geetaben Vasava is an Accredited Social Health Activist (ASHA), who has not had a single day off in the last five weeks. Based in Ghoghamba *taluka* of Panchmahal district, she sometimes walks the undulating terrain for over an hour to reach a patient, who is complaining of shortness of breath but refuses to visit the primary health centre (PHC). Knowing that she is going to see a COVID-19 patient, she carries with herself paracetamol, vitamin C and zinc supplements, while praying that the patient is not serious as she neither has a blood pressure machine nor an oximeter to ascertain the patient's health condition. She urges them to visit the PHC for a follow up but the tribal family would not budge.

A prerequisite to ensure that the rural health infrastructure works effectively in the tribal-dominated area is to convince people that it is safe. Those who do overcome the fear of COVID-19 medicines being a "shot of death or infertility" and make it to the sub-centre or PHC for treatment, are invariably directed farther to the community health centre for want of staff or testing kits. "There is a severe staff shortage at PHCs. Every team is shared between two to three centres. Patients are asked to wait two to three days to take a test, whose results arrive after another three days. For CT Scan or



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oxygen support, the patients are invariably referred to urban centres like Godhra or Vadodara," says Neeta Hardikar, an activist who has been working in the tribal areas of Panchmahal and Dahod districts for 25 years.

At the urban centre of the district, Godhra, Anwar Kachba is the nodal person at the designated COVID healthcare centre that was started last year by a local trust. In February this year, it was disbanded, but restarted in early April on short notice in coordination with the state government. For five weeks, between early April and mid-May, Kachba received at least 15 calls per day from COVID-19 patients seeking hospitalisation. Of these, the makeshift healthcare facility, created from donor support on the premises of a mosque, could admit less than half. "Five of the 15 needed ventilator support, which we did not have. So they went to other government or private hospitals," he says. "At one point, I have seen two patients sharing a bed in hospitals," says Zuber Mamji, secretary of the trust that has set up the COVID healthcare centre.

Responding to the crisis, the district collector converted a section of Godhra Nursing School into a 40-bed intensive care unit (ICU) with 20 ventilators. Godhra Civil Hospital, too, added 15 ventilators. At the Narayan Eye Hospital in Tajpura, Halol *taluka*, 15 ventilator beds and a medical facility were added by mid-April. The district has over 400 COVID care beds with basic oxygen support.

The availability of oxygen, however, is another story. Kachba says, "we could deal with everything, except oxygen and medical staff crunch. Nobody anticipated things would get so serious," he says repeatedly, shaking his head in despair. Panchmahal had elections early this year starting from the *Godhra nagar palika* polls in February, *gram panchayat* polls in March and by-poll of the Morva Hadaf assembly seat, a tribal region, as late as mid-April. "The shortage of trained medical staff is because appointments are made on an 11-month contract. This makes the government jobs less lucrative and the process cumbersome. We need a dedicated full-time health worker cadre immediately," says Dileep Mavalankar, director of the Indian Institute of Public Health, Gandhinagar.

**Social activists working in Ghoghamba and Shahera *talukas* say starvation is emerging as a problem in about 35 per cent of the households they work with. A study conducted in eight districts of Rajasthan and Gujarat shows 58 per cent households in Panchmahal and adjoining areas suffer from food shortages**

## Staring at starvation

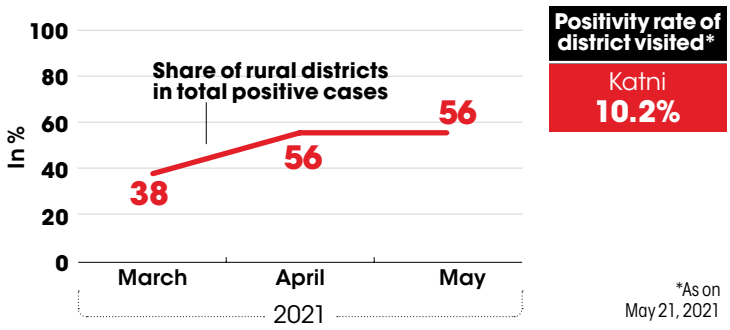
The slowdown in the economy has halted growth in urban areas, but some rural households are already facing starvation. "Most people from the region migrate to cities to work as construction labourers. Following the lockdown in early May, they have returned and are seeking wage-works under the Mahatma Gandhi Rural Employment Guarantee Act (MGNREGA).

Last year, MGNREGA helped the returning informal workforce tide over the lockdown. This year, due to the rollover of the financial year and the government law requiring renewal of job cards every year, several needy families are unable to apply for MGNREGA works. Payment disbursement, too, is not timely. "We see starvation as a problem in about 35 per cent of the households we work with in Ghoghamba and Shahera *taluka*s," says Hardikar, whose non-profit Anandi works on issues of food security and women's health.

The Centre for Labour Research and Action, a Udaipur-based non-profit, recently conducted a study of eight districts in Gujarat and Rajasthan, including Mahisagar and Dahod districts that are contiguous with Panchmahal and share similar socio-economic conditions. It has found that 58 per cent households in the region suffer from food shortages. Project director Sudhir Katiyar says, "We are still investigating the reasons for unusually high number of deaths in Panchmahal and surrounding regions. It appears that construction labourers employed in Ahmedabad are badly hit. The inter-state portability of ration cards is also not working."

## MADHYA PRADESH

**Rural communities left in the lurch as administration deploys doctors from rural areas in cities**




Source: Union Ministry of Health and Family Welfare, How India Lives,Census 2011
Note: Rural districts are those where 60% of population lives in rural areas

COVID-19 is a thing of yore. That was the message coming out of all the steps being taken by the state government around February-March this year. In Katni district, 25 posts of specialist doctors, two posts of medical officers and 13 posts of trauma specialists were vacant even when the cases started rising in April. Ventilators supplied through the "PM Cares Fund" could not be commissioned; there were not enough machines for medical examination; the oxygen plant was also incomplete. The plan of setting up 1,200 hospital beds at 18 government hostels and 31 marriage gardens were scrapped and the district hospital was left with only a 20-bed COVID care centre. Worse, doctors from rural areas were deployed in cities, prompting local legislator Pranay Pandey to write a letter to the chief medical health officer on May 5, and demanding that these doctors be sent back to rural areas. By then, COVID-19 had spread to 124 of the 407 gram panchayats in the district.

In the absence of basic health facilities and human resources in rural areas, the management of the epidemic has proved extremely difficult in Madhya Pradesh

As the government tightens lockdown measures to curb the spread of COVID-19 infections, farmers appear to be the worst hit. Rajesh Kushwaha, a farmer in Bijouri village, says those who grow grains have



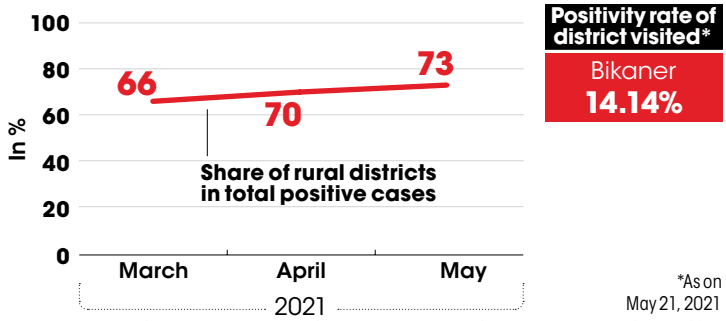

PHOTOGRAPH: RAKESH KUMAR MALVIYA

already harvested and sold their produce. Small farmers like him, who grow vegetables and sell in nearby towns, are not able to venture out because of the fear of the police. "I am now forced to sell my vegetables to local people at throwaway prices," he says. Milkmen are also not able to distribute and are facing huge losses.

Sarman Singh, epidemiologist and director of the All India Institute of Medical Sciences-Bhopal, says, "We have kept our health facilities centred around cities, and in the absence of basic health facilities and human resources in rural areas, the management of the epidemic has proved extremely difficult." There is no hesitation in accepting that the actual number of COVID-19 cases and deaths can be even higher.

## RAJASTHAN

### Scattered hamlets means COVID cases either remain undiagnosed or go untreated in the desert state




*As on May 21, 2021

Source: Union Ministry of Health and Family Welfare, How India Lives, Census 2011

Note: Rural districts are those where 60% of population lives in rural areas

In a desert, cold or hot, it is difficult to say what is more challenging: surviving the harsh conditions or accessing basic facilities like health, education and governance. Preparing for the pandemic and coping with it is probably last on everyone's mind in such regions. And this is what is happening in Rajasthan's Thar desert—one of the most inhospitable yet populated ecoregions in the Indo-Pacific.

Families here migrate between the village and *dhanis* (hamlets in farmlands), depending on the rain and yield season. This makes availability of medical care a logistical difficulty, especially in case of an emergency. Sometimes, the average travel distance to a basic health facility is 50 km; access to a specialised doctor, available only at the district headquarters, is 150 km. Appropriate medical facilities are only available at the block level, but they are now stretched to the limit.

"The situation here is worsening by the day," says Umashankar Yadav, a doctor at the community health centre (CHC) in Bajju block. "We receive patients from Bajju and surrounding villages of Bangadsar, Bhaloori, Mithadiya and Charanwala. On any given day, at least 50 people visiting the CHC show active symptoms of COVID-19. But they have little awareness about the illness or its infectivity," says Yadav.

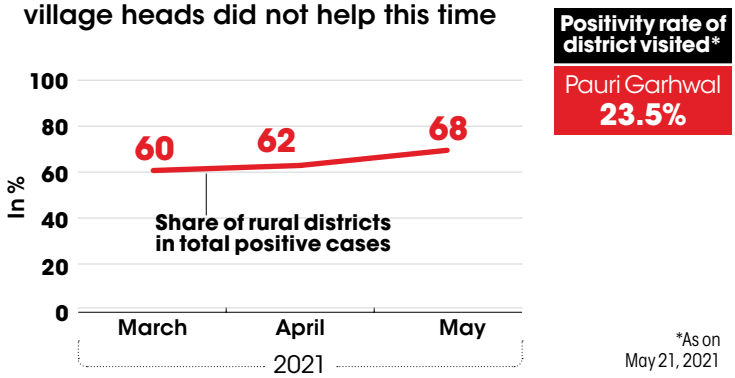
Till last year, Bajju block was just a receptor for returning migrants. This year, between April and May, people in more than 204 villages, with a population of around 8,000, have tested COVID-positive. Hundreds other could not be tested because of lack of awareness and shortage of testing kits. The Bajju CHC receives a total of 100 testing kits in one batch, with no definitive frequency of the next round of supply. These are used up in a single day. The problem is exacerbated as there is no access to instant information channels.

In the neighbouring Kolayat block, which comprises 209 villages, there are three CHCs; only two have a COVID-19 facility with a capacity of 10 beds each. All of them were occupied in the last week of May. "At least 16 people in our village have tested COVID-positive. One patient died of the virus. He was a truck driver and had travelled from Delhi when he first started showing symptoms. We are vigilant of the situation," says Savitri Bishnoi, sarpanch, Mithadiya village. "But now, even the accredited social health activists (ASHAS) are hesitant to visit the infected households." The actual spread of the infection in Mithadiya is unknown.

PHOTOGRAPH: ARVIND MOUDGIL

## UTTARAKHAND

**Denied the tag of COVID warriors after the first wave, village heads did not help this time**




Source: Union Ministry of Health and Family Welfare, How India Lives,Census 2011
Note: Rural districts are those where 60% of population lives in rural areas

In a district that had remained largely untouched by in the first wave of the pandemic, cases are pouring in large numbers, with deaths due to COVID-19 complications already reaching 182. The district administration has created 24 micro-containment zones to curb the spread and has set up dedicated COVID care centres and private facilities, including 478 general beds, 407 oxygen beds and 73 intensive care units. But accessing healthcare facilities is, quite literally, an uphill task in this Himalayan region. District surveillance officer Ashish Gusain admits that it is a challenge for the administration and health workers to negotiate the tough topography of Pauri Garhwal and reach the far flung areas.

As a desperate measure, the block development officers (BDOs) have been asked to form a COVID Niyantran Committee (village-level COVID control committee) under the *gram pradhan*. ASHAs (Accredited Social Health Activists), anganwadi workers and members of Mahila and Yuvak Mangal Dal, who are essentially women and youth volunteers at the grassroots level for welfare works, are required to form this committee to tackle the pandemic in the rural areas.

Satya Prakash Bhardwaj, BDO, Kaljikhal, says all villages in the block have been given 20 medical kits and the COVID Niyantran Committee is being formed now in every village. The state government has provided ₹20,000 to all *gram pradhans* to tackle the pandemic in their villages and a doctor has been deputed at the community health centres in every block.

Meenakshi Devi, gram pradhan of

Last year, people returning to Uttarakhand had to undergo a 14-day quarantine and their health was regularly monitored, but the mechanism was not followed this year



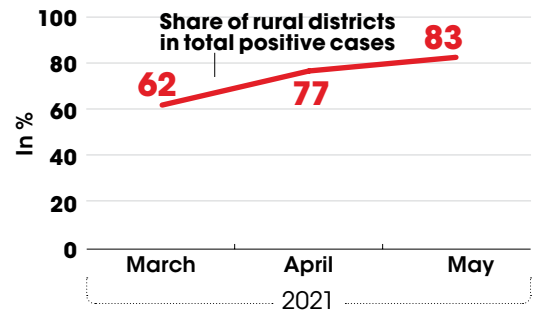
village Paidul in Kot block, says that on May 23 she received a letter from the government asking her to form the committee after her village was declared a micro containment zone with 14 positive cases. "I have no idea how to form this committee without the help of the administration," she says.

The panchayats had played a crucial role in keeping the virus at bay during the first wave. Along with the district administration, they had set up quarantine centres in each village—at schools, at *panchayat bhawans* or on the outskirts of the village by setting up makeshift huts. People returning from different parts of the country after the nationwide lockdown was imposed had to undergo a mandatory 14-day quarantine period at these isolation centres, where their health was regularly monitored.

This practice was not followed during the second wave. People entered the villages without any restriction, wielding a RT-PCR negative report not older than 72 hours. Jagmohan Dangi, a social worker from village Dangi of Kaljikhal block, says festivities like wedding ceremonies, people's reluctance to adhere to COVID protocols and delayed test results have played a role in spreading the infection. Unlike last year, *gram pradhans* were reluctant to perform their duties because their names were not included as frontline warriors and they were not rewarded for their efforts. Neither vaccination nor health insurance was provided to *pradhans* on priority, Dangi adds.

## BIHAR

**Selling farm land and jewellery and borrowing for COVID-19 treatment are fast becoming the norm**




Source: Union Ministry of Health and Family Welfare, How India Lives, Census 2011
Note: Rural districts are those where 60% of population lives in rural areas

The pandemic has robbed us of everything," says Manoj Kumar, a resident of Kurhani panchayat in Muzaffarpur district. In mid-April, his relative Angad Kumar developed cough and high fever. "He went to the community health centre at Kurhani block, where only a rapid antigen test was available. We were relaxed after his test report was negative. Three days later, Angad developed breathlessness. We rushed him to a private hospital where he tested COVID positive in an RT-PCR test. By that time, his oxygen saturation level had dropped below 60 and he had developed severe lung infection. The delay in proper treatment pushed him to death," says Manoj. To pay for the costly treatment at a private hospital, his family had mortgaged gold jewellery and borrowed money.

Such stories of families, who have sold their farmland, spent savings and taken loans from local moneylenders to save their loved ones, are being heard across rural Muzaffarpur and other districts of Bihar. On an average, people are spending ₹2 to ₹5 lakh on COVID treatment at private hospitals. "Local chemist shops are the only hope for those who are too poor to even borrow money," says Suresh Mahto, a resident of Naurangia village panchayat under Bagha-2 block in West Champaran. The primary health centre (PHC) in his village is not functional, with windows and the gate missing. No doctor has visited the PHC in years, Mahto says. His words appear true as 50 per cent of the 5,000 COVID deaths reported from across the state, as between April and May are from rural areas.

Worse, in the second week of April as the second wave of COVID-19 infection swept through Bihar, all doctors and health staff at PHCs and health sub-

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# CAPACITY BUILDING INITIATIVE FOR CITYWIDE WATER AND SANITATION MANAGEMENT



**Date:** August 11-13, 2021 I **Platform:** Zoom

School of Water and Waste (SWW) is organizing its second 'Impact Workshop cum Master Class' of the two-part series events to re-connect with alumni and resource persons for evaluation and assessment as core strategy to achieve higher outcomes of capacity building interventions. The 3-day workshop aims to bring together the SWW alumni, institutional programme partners, key resource persons – participants of various short-term trainings (including residential, online trainings/ webinar), workshops, knowledge conclaves, field exposure visits to identify the 'change agents' ***– water manager and leaders.***

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## PROGRAMME DESIGN

**Date: 11th August 2021 (9.30AM – 1.30PM)**
**Theme:** Sustainable Water Management
Water Sensitive Urban Design and Planning, Rainwater harvesting, Green Infrastructure and Nature Based Solutions, Urban Lake Management, Water and Communication, Tools and Approaches for Citywide Water management, Mainstreaming Water-Energy Nexus in Wake of Climate Change, Green Infrastructure Knowledge Conclave 2020

**Date: 12th August 2021 (9.30AM – 1.30PM)**
**Theme:** Sanitation, Wastewater and Faecal Sludge / Septage Management
Tools and Approaches for Citywide Sanitation, Citywide Inclusive Sanitation, City Sanitation Plans & Faecal Sludge Management, Excreta Flow Mapping – Shit Flow Diagrams, Decentralised Wastewater Treatment including Local Reuse, SaniPath, Water and Sanitation Safety Plan, SFD Week Knowledge Conclave-2019

**Date: 13th August 2021: Aspirational Talks by Invited Global and National Experts**

**First Session:** 10AM – 12.30PM
**Theme:** Sustainable Water Management and Technical Session

**Dr John Cherry -** Distinguished Professor Emeritus, University of Waterloo, Canada
**Dr Veena Srinivasan -** Senior Fellow- ATREE, Bangalore, India
**Anusha Shah -** Director Resilient Cities, Arcadis, UK
**Tony Wong, Professor -** Monash University, Australia
**K. Madhavan -** Chief Executive Officer, WaterAid, India
**Aloka Majumdar -** Head CSR HSBC, India
**Dr Kala Vairvamoorthy -** Executive Director, IWA, India

**Second Session:** 3PM – 5.30PM
**Theme:** Sanitation, Wastewater and Faecal Sludge/ Septage Management

**Dr Kate Medicott -** Team Leader - Sanitation, WHO, Switzerland
**Juliet Willetts, Professor -** University of Technology, Sydney, Australia
**Christoph Luthi, Professor -** EAWAG SANDEC, Switzerland
Dorai Narayana - International Consultant FSM, Malaysia
**Arne Panesar -** Head Sanitation Programme - GIZ & Sustainable Sanitation Alliance (SuSanA), Germany

**If you are an Alumni of CSE – SWW or CSE institutional partner and interested to be a speaker at the Impact workshop to share your experience on above mentioned objectives, kindly submit a short abstract (max 500 words) of your presentation before 4th July, 2021 to the undersigned coordinators.**

- Top 10 impactful alumni will be awarded a Certificate as "Water Champion"
- Top 10 impactful alumni stories will get a full fellowship to attend a 3-day residential training cum knowledge conclave at AAETI.

## WORKSHOP COORDINATORS


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centres were asked by the principal secretary of the health department to join COVID-dedicated hospitals at the district headquarters on deputation, leaving the health services in villages non-funtional. In Muzaffarpur alone, nearly 90 doctors and hundreds of paramedical workers joined COVID-dedicated hospitals and health centres in Muzaffarpur headquarters. Most PHCs remained locked or closed for weeks as COVID-19 made inroads into villages.

The missing rural doctors were noticed in the second week of May. Following a surge in deaths due to COVID-19 complications in rural areas, the health department ordered the return of doctors and health workers back to PHCs. Pratyaya Amrit, additional chief secretary, health department, announced that the government has decided to reactivate 1,451 additional PHCs to augment health infrastructure in rural areas and has deployed 80,000 ASHA workers to monitor COVID patients in home isolation. But it is too late for many.

## Litchi farmers, artisans hit hard

Muzaffarpur is known for its summer fruit, litchi. As lockdown was imposed in early May, it badly hit not only thousands of litchi farmers and labourers engaged in plucking, packaging and loading, but also hundreds of local agents who deal with fruit traders from outside the state. Like last year, the lockdowns and restrictions on interstate movement mean that traders from other states will not come to their villages to buy the fruit.

Litchi orchards are spread over nearly 12,000 hectares in Muzaffarpur, which along with some of the neighbouring districts, accounts for nearly 40 per cent of the country's litchi production. Litchi Utpadak Sangh officials say more than 5,000 litchi farmers are likely to face another bad year for business. Thousands of labourers and artisans in the district, who make light wooden boxes for packaging litchis, will also be rendered jobless if traders do not visit Muzaffarpur to purchase the fruits.

A youth in West Champaran carries his COVID-infected mother on a hand cart from his village to the hospital in a nearby city. In early April, the state government had asked all doctors and health workers in rural areas to join the workforce at district headquarters on deputation

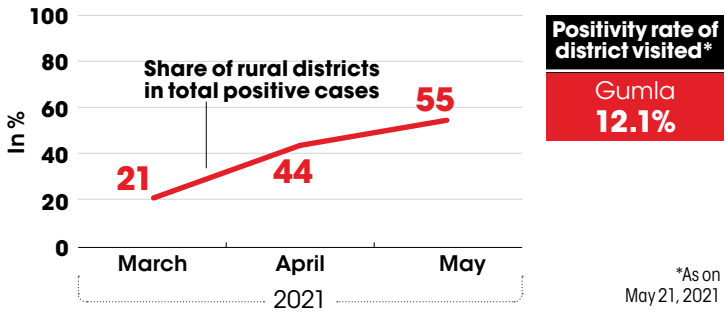


PHOTOGRAPH: MD IMRAN KHAN

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## JHARKHAND

**The state plans to train *jholachaap* doctors to meet acute shortage of healthcare workers in rural areas**




Source: Union Ministry of Health and Family Welfare, How India Lives, Census 2011
Note: Rural districts are those where 60% of population lives in rural areas

Gulpa Ghasi, a 45-year-old resident of Chatakpur village in Kondara block of Gumla district, was suffering from cold, cough and fever for almost a month. Since the community health centre was 28 km away, he relied on the village *jholachhaap* doctor, an individual without a degree to practice medicine but who still disburses pills for common ailments and is the only source of medical aid available in remote areas. Suddenly, one day in early May, Ghasi started gasping for breath. By the time the village *sahia* (health worker) reached with an oximeter, Ghasi died. According to his daughter Koyli, he earned by making *mandars*, a traditional musical instrument.

As reports of cold, cough and fever started pouring in from almost all villages in the district, the administration conducted an investigation camp between May 4 and 17. It found patients infected with COVID-19 in 406 villages.

"Every day, we receive 30-40 patients," says Govinda Mandal, also a *jhola chhaap* doctor from Kondara village in Gumla. "Almost everyone complains of cold, cough and fever these days. I give medicines worth ₹500-600 to each patient. If someone shows symptoms of COVID-19, I prescribe them vitamin C, zinc supplements and also recommend a COVID-19 test." Kamlesh Kumar, another rural doctor from the village, says, "The government is going to provide training for COVID-19 treatment in rural areas. For this, his name has gone to the block development officer. For the time being, we understand that the lives of the village residents are saved only through the help of the medicine shop and doctors like us," he says.

This is unsurprising for a tribal district with 1 million population, where just 59 doctors are available against 127 posts approved. This means, Gumla has just one doctor for every 17,372 people. In Kondara block, the health centre buildings are used to accommodate paramilitary personnel and police officials, deployed in the area for anti-Naxal operations. In one village, Qatari, sarpanch Aruna Ekka informs that even the panchayats have not been provided with any funds or medical kits this time to provide isolation or treatment facilities to people.

Panchayats are, however, managed to ensure that people, particularly informal workers who have returned to the village following the lockdown restrictions, are able to earn through jobs under MGNREGA. At least six projects are running in every village, though delays in payment is defeating the purpose at several places. According to James Herrenj, convener of Jharkhand MGNREGA Watch, ₹94.15 lakh is pending as MGNREGA wages for labourers in Gumla.

Selling vegetables like watermelon is another major source of cash for people in the region, where most farmers are small or marginal landholders with less than 2 ha land. They are not able to sell their produce since the government imposed lockdown in April 22. Arpan Oraon of PRADAN, a non-profit that organises people for farming, says, watermelon crops are ready for harvest on most farms now. But very few traders are willing to pick up the produce. To ease the process, the government has introduced e-pass system using which farmers can transport their crop to markets. Himanshu Kesari, president of Gumla Chamber of



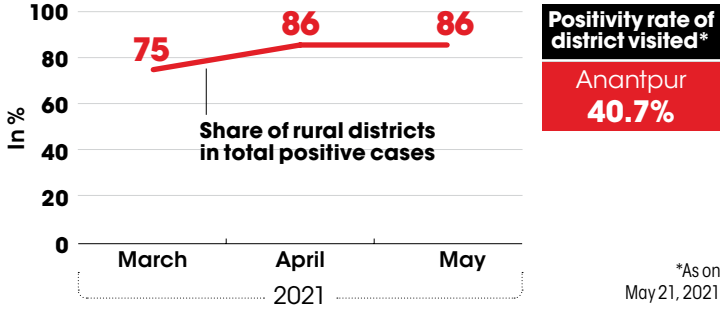
^ In Anantpur district of Andhra Pradesh, MGNREGA works have come to the rescue of informal workers who have returned home because of COVID-19 restrictions. It is also benefitting farmers who have left their land fallow as traders are either reluctant to pick up produce

PHOTOGRAPH: BY ARRANGEMENT

Commerce, says, "the e-pass system is of little help as most farmers in the region do not even own a mobile. Those who have access to one, do not know how to register for e-pass." Harishwar Dayal, an economic expert and director of the Center for Financial Studies, Jharkhand, says during the nationwide lockdown last year, 850,000 labourers had returned to Jharkhand. All of them migrated as soon as they ran out of savings. To maintain the rural economy, the government must bring in more works related to agriculture and non-farm sector under MGNREGA.

## ANDHRA PRADESH

**Long, repeated lockdowns have destroyed local businesses; farmers reluctant to grow crops**




Positivity rate of district visited*
Anantpur
40.7%

*As on May 21, 2021

Source: Union Ministry of Health and Family Welfare, How India Lives, Census 2011
Note: Rural districts are those where 60% of population lives in rural areas

Uncertainty and worry are writ large on the face of C Ram Mohan Reddy, a fruit farmer in Gongireddyypalle village in Raptadu *mandal* of Anantapur. Of his 3.2 ha farm, he grows bananas on 1.2 ha, grapes on 0.4 ha and pomegranate and sweet lime on the remaining. For the past two years, he has not been able to earn from his crops due to repeated lockdowns imposed due to COVID-19. Untimely rains and strong winds in May this year have only made matters worse for him.

The 18-hour-a-day lockdown, from 12 pm to 6 am, in Andhra Pradesh has reduced the rate of his banana crop to rock bottom levels, he says. "Traders are not prepared to pick up the crop for any price now. The small window of time left for people to shop does not give confidence to traders about the quick sale of this perishable product. They are offering me not more than ₹2,000 for a tonne of bananas, which should have earned me ₹15,000 to ₹16,000," he says. After facing similar losses during the lockdown last year, Reddy had borrowed ₹2 lakh to meet his expenses. This time, he has invested ₹3 lakh on the banana crops alone and earned ₹1 lakh so far. Desperate, Reddy now plans to fell his entire plantation,

which still can bear fruit for a third year.

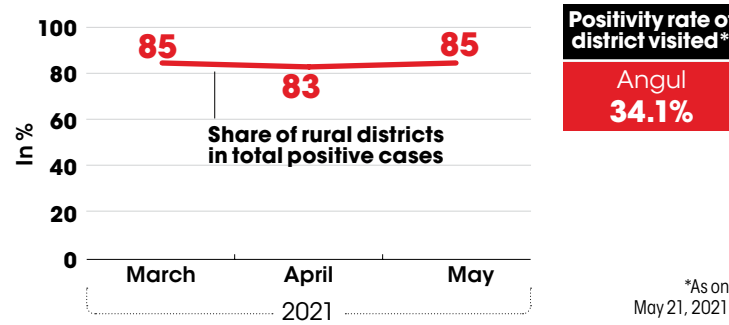
Similar is the case of V Chennappa, a chilli farmer in Kanaganapalli village. "A good crop of green chillies requires heavy investment on inputs. Since traders are offering half the price for it, I have decided to leave the land fallow for some time. Instead, I plan to shift to a new variety of red chillies, grown in Karnataka, which can be dried and stored and thus be sold whenever the market is suitable," says Chennappa. His words mirror the undaunted spirit of hope that keeps the farmers going in the face of adversity.

The only crop that has fetched a good price for farmers during the pandemic is sweet lime, which sells for ₹1,10,000 per tonne. "I have never received such a good price for sweet lime in my life," says M B Ramudu, from Mukundapuram village of Garladinne mandal. "I initially sold the first tranche of my crop for ₹62,000 a tonne. The rate quickly rose to ₹1,10,000. I still have 30 tonnes of crop ready for harvest." Though Ramudu has lost some of the plants on his 4 ha farm during the recent heavy rain and gales, he is confident to recover the losses. "Citrus fruits are in high demand during the pandemic as they help boost immunity," he says.

For the landless and small farmers, MGNREGA seems to have emerged as a lifeline. They now rely on the wage works to tide over the lockdown period. To ensure that COVID-19 remains under control, the district administration is conducting fever surveys every three days. "Institutional isolation centres have been set up for symptomatic persons," says District medical health officer Y Kameshwara Prasad. "Our ANMs (auxiliary nurse midwives are trained village-level health workers) have been given a thermometer, pulse oximeter and home isolation kits to monitor people in home isolation. In hospitals, we have increased the number of oxygen beds by three to four time, added 150 ventilators and increased beds. We are now prepared for any eventuality," Prasad adds.

## ODISHA

### Absence of a mechanism to test and isolate returning workers caused a rise in cases




Source: Union Ministry of Health and Family Welfare, How India Lives, Census 2011
Note: Rural districts are those where 60% of population lives in rural areas

At the beginning of the second wave of the pandemic, Angul, a district where mining, industrial and agricultural activities go on side by side, 23 cases of COVID-19 were registered on April 1. By the last week of May, the district had registered 778 cases, the highest in the state. Such a steep rise is unprecedented for a state that was at the forefront of India's fight against a rapidly growing COVID-19 pandemic at the time of the first wave.

"Social gatherings that defied all COVID-19 protocols are the main cause of rise of infections in rural Angul," says Trilochan Pradhan, chief medical officer of the district. "Unlike last year, no strict quarantine measures were put in place by village *panchayats* this time. COVID care centres were also not established by the *panchayats*. So the informal workers who returned home, either because of the second wave or due to closure of businesses, were not asked to stay in isolation. This caused the infection to spread," says Purna Chandra Sahu, resident of Tainsi village in Angul block, which has had a high number of cases.

The home isolation system has completely failed in rural areas, as families are relatively large and houses have few rooms, says Swapna Sarangi, team leader of the non-profit Foundation

of Ecological Security. Official quarantine centres are the best way to isolate infected patients to break the chain of transmission. But micro-containment was not done adequately this time. A poor health infrastructure in the industrial-rich district is now unable to tackle the surge, says Sarangi. COVID-19 patients even sat on *dharna* at Talcher hospital protesting negligence in services.

COVID-19 management became further difficult in rural Angul as half of the eight sanctioned posts of block development officers are vacant in the district. The administration did intensify its efforts to bring the surge under control, but after almost two months of the second wave. It set up RT-PCR laboratories for COVID-19 testing in 16 district headquarters only towards the end of May. The 120-bed Dedicated COVID Hospital (DCH) with 10 ventilators, 20 high dependency units and 90 general beds were made functional at Talcher only on April 30. A 66-bed DCH has been set up on the premises of Employees' State Insurance (ESI) Hospital, Banarpal, on May 3. ASHA and anganwadi workers have also begun conducting house-to-house surveys. "We have introduced the first-of-its-kind emergency COVID-19 auto ambulance service in all blocks, so that serious symptomatic persons can reach the medical facilities at the earliest," says district collector Sidhartha Sankar Swain.

Across the state, the government has decided to appoint 786 doctors and 5,137 paramedics and declared incentives for *gaon kalyan samitis* (essentially village-level welfare volunteers), ASHAs and *anganwadi* workers for their contribution in managing the pandemic. The scope of MGNREGA works has also been increased. But untimely payment have dashed all hopes of the informal workers, who are making desperate attempts to return to cities and towns.




After a sharp rise in cases in Odisha, the government rushed to make necessary arrangements

PHOTOGRAPH: C R SAHU

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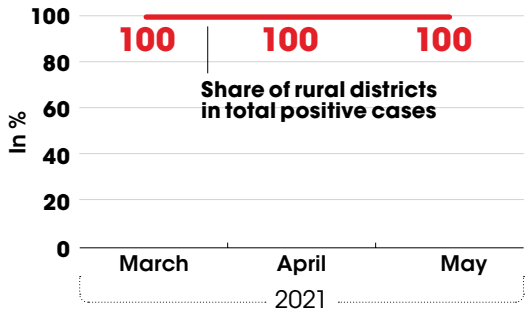
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Dhamtari lies in the heart of Chhattisgarh. A large number of its villages are forested, where people live in scattered hamlets. It did not come as a surprise when the district started reporting COVID-19 cases on May 25, 2020, five months after the first case of the infection was diagnosed in the country. An alert administration has since then recruited more medical staff, increased beds for COVID-19 patients and also secured oxygen beds.

Yet, when the second wave took the country by the storm, Dhamtari reported 10,180 positive cases in April 2021 alone. This was five times the number of cases reported in September last year.

## CHHATTISGARH

**The infection is in extremely remote areas where people are hesitant to report**




**Positivity rate of district visited***

Dhamtari
**14.3%**

*As on May 21, 2021

Source: Union Ministry of Health and Family Welfare, How India Lives, Census 2011
Note: Rural districts are those where 60% of population lives in rural areas. By this definition, all districts in Himachal Pradesh that recorded cases in March-May are rural



PHOTOGRAPH: PURUSHOTTAM THAKUR

This is because the district still suffers from some basic challenges, explains D K Turre, chief medical health officer of the district. Making people aware of COVID-appropriate behaviour, of the importance of timely reporting to control rooms or to the helpline numbers in case of COVID-like symptoms; and persuading them for vaccination are some of the major challenges, he says.

A walk through the district shows why people are reluctant to report about their illness or getting themselves tested. "My parents and I have cold, fever and dry cough. Our neighbours, too, have the same problem. But none of us are willing to go for testing. There are long queues at hospitals. So we prefer taking medicines from a village doctor," Mahendra Tarak, a 22-year-old resident of Donar village, had told DTE in early May. Tarak used to work as a contract teacher at a Central government school in Dhamtari. He now runs a small business as his job did not get renewed after the lockdown last year. Later that month, at least 25 residents of the village were diagnosed COVID-positive in tests organised for the village. Within days, the number has increased to 84.

A social activist who does not wish to be named says that the situation could be worse in villages like Nagri and Magarlod, which are located deep inside forests. Cases of fever and deaths are already being reported from these areas but people avoiding testing means they do not get officially reported.

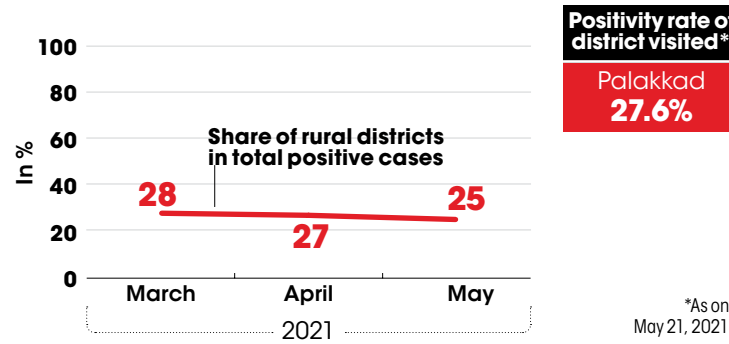
The east-flowing river Bhavani was in spate during the third week of May due to heavy showers precipitated by Cyclone Tauktae. But that has not prevented 40-year-old medical officer K A Sukhanya from crossing the river and trekking for about 17 km to reach a COVID-19 affected forest village in Attappady, Kerala's tribal heartland, in Palakkad district. Sukhanya was accompanied by health inspector Sunil Vasu, junior health inspector Shaiju, and her driver Sajesh. Their destination was the Murugala tribal hamlet located deep inside the Western Ghat forests, which spread across Kerala and Tamil Nadu. Almost marooned by the rains and flash floods in the river, the hamlet of 40 families are living in fear after many of them developed COVID-19 symptoms.

"The whole journey was tedious as there was no road access to the hamlet and the terrain was difficult. Our ambulance was able to move only for 13 km of the 30-km distance," recalls Sukhanya when contacted by DTE. "Seven of the hamlet residents were showing symptoms of COVID-19 and it took a lot of persuasion to take them out of the remote forest dwelling. They later tested positive, and we ensured their isolation and treatment at the domiciliary care centre (DCC) at Pudur, a town in Attappadi. They are getting monitored now."

Home to 32,956 tribals, Attappady is among the most backward regions in Kerala. However, the countryside that

## KERALA

**Treating tribal population, migrant workers and inter-district travellers is the big challenge**




Source: Union Ministry of Health and Family Welfare, How India Lives, Census 2011
Note: Rural districts are those where 60% of population lives in rural areas

< People in Chhattisgarh's Dhamtari district are reluctant to get themselves tested or visit hospitals for treatment. Activists fear that infections could be spreading in remote forested villages of the district



^ The administration of Kerala's Attappady district is on its toes after seven people in the tribal hamlet of Murugala have been diagnosed COVID positive. There is no road access to the hamlet, which is located deep inside the Western Ghat forests

shares a border with Coimbatore district of Tamil Nadu is one of those rural areas that witnessed a rapid spread of the pandemic in its second wave. R Prabhudas, nodal health officer of Attappady, says the health department is making extra efforts to access remote tribal hamlets in the face of the second surge. Still, there are several of them which are inaccessible. "There are limitations in reaching COVID-related awareness to these remote forest villages. Most people refuse to adhere to COVID-19 protocols. As these villages have several forest routes to Coimbatore, they mingle freely with people in other areas where the caseload is already high," points out Prabhudas. Similar is the case of other tribal hamlets like Nelliyampathy and Parambikulam in Palakkad.

Though the risky outreach by Sukhanya and her team became a major topic for discussion on social media, with Kerala's new health minister Veena George congratulating her over the telephone, Palakkad's preparedness in the face of the second wave of COVID-19 remains dismal. On May 30, the COVID-19 nodal officer of Government Tribal Specialty Hospital (GTSH) at Kottathara, SR Rejaneesh, wrote a letter to the hospital's superintendent detailing the alarming shortage of human resources and equipment to deal with the surge and to run COVID-19 intensive care units (ICU). Across the district, 60 tribals tested COVID-positive on May 30 alone.

PHOTOGRAPH: KALISAMY ATTAPADY




"Most often, we have to run the whole intensive care unit (ICU) with a capacity of 11 patients and just one nurse. Such a situation will seriously affect the quality of care. We need a minimum of four staff nurses and a corresponding number of support staff on duty," Rajaneesh tells DTE. He has also sought to increase ventilator beds to 10 from the current four. "When we increase the ventilator beds to 10, there should be a minimum of eight staff nurses and corresponding support staff at a time for the smooth functioning of the ICU."

Rajaneesh highlights the need to ramp up oxygen capacity. "Currently, we have five multipara monitors. We need eight more. As highlighted at a meeting with the district collector, we urgently need a liquid medical oxygen plant of 1-tonne capacity. That amount is not even adequate to run three to four ventilators at a time, in full capacity," he says.

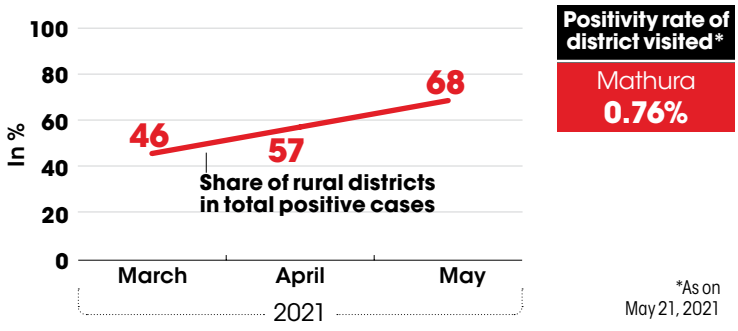
In the absence of adequate health infrastructure, the district administration has deputed 500 trained volunteers to apprise people of successive waves of the pandemic. "COVID treatment facilities have been set up at one government medical college hospital and a district hospital. The authorities have empanelled several private hospitals to ensure treatment to beneficiaries of government health schemes, especially tribal communities and the rural poor," says district collector Mrunmai Joshi.

The state government has already declared to provide vaccines against COVID-19 free of cost to all and has sanctioned ₹1,000 crore for vaccine procurement. According to Muhammed Asheel, the state's social security mission director, the government is battling the second surge, which has spread to rural areas, by quickly expanding capacity in rural hospitals and primary health centres by adding more ICU beds, ventilators and enhanced oxygen supply. "The state has 0.38 million community volunteers who are helping the government in this fight against COVID-19. The laboratory network has been strengthened from a single testing centre at the beginning of the pandemic to 2,667 facilities now for COVID-19 testing. A treatment package for COVID-19 patients at private hospitals was also declared, to bring in fairness in treatment costs across various hospitals," says Asheel.

Though over 2.3 million cases of COVID-19 had been reported in the state so far, Kerala has managed to contain deaths to over 6,000 cases. On May 30, Chief Minister Pinarayi Vijayan said the number of active cases dropped significantly during the past three weeks. "We need a lockdown to bring it down further," he, however, added.

## UTTAR PRADESH

**Though the numbers are falling, a lot of people are unsure of symptoms, report associated illnesses**




Source: Union Ministry of Health and Family Welfare, How India Lives, Census 2011
Note: Rural districts are those where 60% of population lives in rural areas

Both the residents and the administration of Mathura are nervous even as the Uttar Pradesh government starts easing the over two-month-long COVID-19 lockdown restrictions. "We cannot take the risk right now. The two private medical colleges in the district will continue to function as COVID-19 hospitals this month. In view of the third wave, we are increasing the capacity of the District Women's Hospital and the District Combined Hospital Vrindavan, where the oxygen pipelines have already been installed," says Rachna Gupta, chief medical officer of the district.

The temple city had started reporting the illness much before Uttar Pradesh emerged as a COVID-19 hotspot in the country. But its downward turn of the infection rate has been rather slow. While the rate of infection in cities across the state had slowed down, on May 17 the positivity rate in Mathura was still quite high. And on May 23, the district still had 1,000 active cases. There had also been a few cases where the illness was caused by the South African variant of the virus, which is known to be more contagious or susceptible to spread widely.

Some officials, on the condition of anonymity, blame this complex and prolonged battle of Mathura against COVID-19 on a variety of reasons. Being a city considered holy by Hindus, it is regularly thronged by visitors from far and wide. A sequence of events—right from the festival of Holi, the weeks-long religious congregation of Kumbh Mela in Haridwar, a nearby pilgrimage site in Uttarakhand, and *panchayat* elections in the state—are also believed to have contributed to the district's caseload.

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R K Gupta, who retired last year as additional director (Integrated Disease Surveillance Programme) from Uttar Pradesh's Directorate of Medical and Health Services, cites another reason. While some people are not willing to report about the illness fearing stigma, Gupta says, many others are not aware of its symptoms and hence ignore it. "It is too early to say that the epidemic is over until we do complete surveillance."

As people recover, they now find themselves in another fix. Anil Chaudhary, a resident of Khushipura Majra in Ral village, tells DTE that wheat-loading activities are currently ongoing in the village. "Our farmers used to sell wheat earlier at Hodal in Palwal district of Haryana, which offers a price higher than the minimum support price announced by the government. This time too the tractors have been waiting there for our produce since mid-May. But due to the inter-state travel restrictions because of the lockdown, we are neither able to deliver to them the crop nor can they enter the district to lift the grains."

Chaudhary says he and several other farmers from his village have now registered for government procurement of the grains as they have no place for storing. "Even for procurement, I have to transport my 5,300 kg of wheat to the purchasing centre 50 km away. I am not sure if I can transport the grains to the centre," he says. "Following COVID-19, I am now broken physically and financially."

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# CONSUMED BY THE SECOND WAVE

COVID-19's impact on the rural economy is likely to be much worse than that of disasters like droughts and floods

**SHAGUN KAPIL** AND **RICHARD MAHAPATRA**

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THE PANDEMIC had never really flattened for rural India. With the second wave making inroads into the hinterlands, experts foresee a vicious cycle for the country's over-half-a-billion rural residents. Rural Indians—mostly an informal workforce and poor by any accepted definition—have been living with irregular jobs as the pandemic continues to ravage the world for over a year. The second wave, with more cases of infection in rural India, will aggravate this economic crisis. Expenditure on health may also go up as cases rise, draining people's income or savings.

According to the Centre for Monitoring Indian Economy (CMIE), an independent research firm, job losses and unemployment are now being reported from rural areas, unlike last year. CMIE's recent data indicates the national unemployment rate is nearing the level seen in June 2020, the highest in recent memory, that arose from the nationwide lockdown and restrictions to curb the spread of COVID-19. For the week ending May 16, unemployment for urban areas was 14.71 per cent, while that for rural areas was 14.34 per cent. "The pandemic has slowed down the labour participation rate to 39.9 per cent from an average of 42.7 per cent in 2019-20," states the Reserve Bank of India in its monthly bulletin for May.

**ECONOMIC IMPACT OF THE SECOND WAVE WOULD BE HARDER DUE TO LOSS OF DEMAND IN RURAL INDIA, WHICH PROBABLY WILL NOT PICK UP SOON EITHER**

**INDIA RATINGS AND RESEARCH**
Credit rating agency

This high level of unemployment, particularly in rural areas, is referred to as the tipping point. "In 2017-18, the unemployment rate was at a 45-year high. COVID-19 has magnified this problem," says Santosh Mehrotra, visiting professor, Centre for Development, University of Bath, UK, and former economics professor, Jawaharlal Nehru University, Delhi. The second wave, as various estimates show, has hit the unorganised sector the most. "Unlike the first wave, rural supply chains will be impacted because farmers and cultivators are also infected," says Mehrotra. Though there is no nationwide lockdown this time, all states have imposed restrictions on movements and activities. The stringency of lockdowns, unlike last year, varies from state to state and from district to district. Similarly, the easing of restrictions will also depend on individual states.

Agriculture, which employs over 50 per cent of Indians and is the only sector to clock a positive growth of 3.6 per cent at constant prices in 2020-21 during the first wave of COVID-19, could be severely impacted because of the ongoing second wave. Dependence on agriculture is still very high as it engages about 60 per cent of the rural workforce, but contributes only about one-fourth of rural households' income, indicating an abysmally low



PHOTOGRAPH: MOHD IMRAN KHAN

^ In Bihar's Muzaffarpur district, famous for its litchi crops, the fruit is ready for harvest. But lockdown measures have restricted movement of traders from other states to purchase the fruit. This will not only affect earnings of farmers, but also render jobless thousands of artisans who make light wooden boxes to package litchis

income for those dependent on agriculture. This is already visible during the recent rabi season and may also impact the upcoming kharif season, depending on the trajectory of the pandemic.

## AGRICULTURE FALLS VICTIM TO COVID

Farmers have harvested rabi crops, but sales have been impacted due to surging COVID-19 infections and *mandi*s (wholesale markets) that have remained closed since April 2021 due to lockdown-like restrictions in several states. During the first wave, supply chain glitches hindered the transport of produce from primary *mandi*s to secondary and bigger markets. This time around, at many places, the farm produce is not even reaching primary *mandi*s.

Last year, even though the lockdowns were more stringent, primary *mandi*s at the village level were largely kept away from restrictions. This was because the infections were low or nil in rural areas. In states like Punjab and Haryana, where government procurement is high, most of the wheat crop has been lifted. This is not the case in other wheat-producing states like Uttar Pradesh (UP), Madhya Pradesh (MP) and Rajasthan.

Comparative data of wheat arrivals for the period of May 1-21 in 2021 and the same period last year shows the arrivals are dismal. In MP, the arrivals are down by 2.3 million tonnes compared to last year—a 77 per cent decrease, shows data with Agmarknet, a government portal. In UP, they are down by 36 per cent. "It looks like more than 50 per cent of the overall

wheat crop is still stuck in states like Rajasthan, UP, Maharashtra, and MP," says Prasanna Rao, co-founder and chief executive, Arya, a warehousing and finance platform for farmers and farmer producer organisations. Soybean arrivals in MP are also down by 76 per cent. Rao says, "For us, May is a busy month due to a lot of harvest and commodity arrivals. This time, it is a complete washout." This has an impact on farmers' livelihood as those who want to sell their produce are unable to do so.

In Maharashtra, onion, a rabi crop, is ready for harvest. But farmers are unable to sell as all the *mandi*s in the state, including Lasalgaon, Asia's largest onion *mandi*, have remained shut since May 12. Though onion has a long shelf life, unseasonal rainfall in the last few days has led to the growth of fungus in some stored stocks, says Bharat Dighole, a farmer and member of the Maharashtra State Onion Growers' Association. "Almost 40 per cent onion farmers in Maharashtra are not able to sell their produce. Money earned from onion is crucial for buying seeds and fertilisers and prepare for the next crops like maize, cabbage and soybean in June. They have no cash in hand this time." The other worry among farmers is that once *mandi*s reopen, there will be a sudden increase in arrivals, which will lead to a market crash.

This is also the season for high-value horticulture crops like mango and litchi. Malda, one of the biggest mango producers in West Bengal, has a "bumper" yield of mangoes this year due to favourable weather conditions. The district produces Fazli, Himsagar, Lakshmanbhog, Amrapali and several other popular varieties of mangoes in over 33,000 hectares and has a huge market across West Bengal and in other states such as Assam, Tripura, Bihar and Jharkhand. But the second wave has struck right around the peak harvest season. Agriculture experts say close to 350,000 tonnes of the fruit will be ready for harvest in June. "Most fruits are picked in the first week of June as a majority of the Malda varieties mature late," says Ujjwal Saha, president, Malda Mango Merchants' Association. During these crucial weeks of production, farmers need to take special care and apply pesticides to prevent attacks by insects and fungal infections. But now, labourers that are skilled for the work are refusing to come to the orchards, fearing COVID-19. This will surely have an impact on the quality of mangoes, Saha says. Restrictions on market timings and transport have also affected sales. Dipak Mandal, associated with the Indian Council of Agriculture Research-Central Institute for Sub-tropical Horticulture in Malda, says, "Due to COVID-19, interstate transport has been restricted. So the dispatch has stopped and export to different states is uncertain." This will be a terrible blow for Malda farmers, who had incurred a loss of ₹1,500 crore last year due to restrictions and the devastating cyclone Amphan.

**40 PER CENT ONION FARMERS IN MAHARASHTRA ARE NOT ABLE TO SELL THEIR PRODUCE. MONEY EARNED FROM ONION IS CRUCIAL FOR BUYING SEEDS AND FERTILISERS AND PREPARE FOR NEXT CROPS**

**BHARAT DIGHOLE**
**Farmer and member, Maharashtra State Onion Growers' Association**

Even with the rise in cases and deaths, there is optimism about the performance of the agriculture sector, especially after the India Meteorological Department's forecast of an above normal monsoon in 2021. There is also hope that the situation would be much better by the time sowing for kharif starts from mid-June. But on the other hand, the possibility of farming families getting infected is also real and may impact sowing operations. Says Mehrotra: "Even though you will have a good monsoon, agriculture may not perform as well as last year. If people are sick, they may not be able to work and earn. As such, there are far too many workers in rural areas—those who had left for urban areas have returned—and not enough work. So this is a return to the situation prevailing last year but in the worst circumstances."

This is especially true for states like Punjab and Haryana that are highly dependent on agricultural labourers from UP and Bihar for the sowing of paddy. Last year, labourers who had returned to

their villages were brought back by contractors during the paddy sowing season. But this was only possible as the villages were still untouched by COVID-19 and most labourers were healthy.

The shrinking of the female labour force participation post-pandemic, and especially after the second wave, may further affect sowing operations as around 80 per cent of farm work is undertaken by women in India. Pradeep Kashyap, founder of Rural Marketing Association of India, a not-for-profit industry body, says, "With the infection rate rising in rural India, we are seeing a trend of women dropping out of the labour work force to either take care of those ill in the family or to stay healthy to take care of the household."

## FOOD SECURITY AT RISK

The Indian Council of Agricultural Research in its May 20 advisory states that the second wave may impact agricultural production and national food and nutrition security. "The magnitude of the problem in rural India is huge, but policy response to it has been very low. We are still struggling with oxygen and critical care breakdown in urban India. The salaried job loss in rural India will have a cascading impact on several sectors," Sunil Kumar Sinha, principal economist of Indian Ratings and Research, a Fitch Group company, was quoted saying by the media.

The impact on the rural economy may even drain the overall economy. India Ratings and Research (IND-RA), a credit rating agency, says the economic impact of the second wave would be harder due to loss of demand in rural India, which is not likely to pick up again soon. Rural consumption was a boon for the economy during the first wave of the pandemic for it remained largely unaffected till early 2021. But with a positivity rate of over 10 per cent in more than half the country's districts, the expenditure pattern of rural households can take a turn for the worse,

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# "This is an economic collapse triggered by a health crisis"

**SANTOSH MEHROTRA**



SHOCKINGLY, THE government has reduced the actual allocation for health in the 2021-22 Union budget. That's outrageous in the second year of the COVID-19 pandemic. So we have serious problems in all kinds of health infra-structure and the crisis becomes even deeper in rural areas.

This health crisis has an economic impact. We already have far too many workers in rural areas and not enough work. So this is a return to the situation that was prevailing last year, but in worse circumstances. People this time have less money because they are spending on health. This is out-of-pocket expenditure; in many cases, it is spent on frauds. So they do not even recover. Some might also risk getting long COVID-19 and may not return to work soon.

As a result, people have become poorer than last year. I have estimated that poverty had increased since 2019 because joblessness had risen and wage rates had fallen. On top of that, we have had two waves of COVID-19. Rural poverty in any case in 2012 was about 26 per cent. What we are seeing now is a 10 per cent increase of the 2012 number, contributed primarily in rural areas, because two-third of our population lives here. When poverty increases at this rate, then aggregate demand in economy collapses. When that happens, the organised sector is impacted.

*(Author is visiting professor, Centre for Development, University of Bath, UK, and former economics professor, Jawaharlal Nehru University, Delhi)*

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even if agricultural output and income remain the same. There may be a tendency to suppress discretionary spending due to the fear of impending disease, says Abhirup Bhunia, an international development consultant. "A downward force on consumption and demand in rural areas this year will hit us. Rural demand saved us in 2020. A health crisis of this measure will put pressure on out-of-pocket expenses for many families," says Bhunia.

The share of government in the current expenditure on health in India is only 27.1 per cent; a large share of 62.4 per cent is borne by households. "So people are going to try and save more and cut down on consumption. High out-of-pocket expenditure will put them in a debt situation," he says. This debt can be more damaging than other types of household debt. "As these expenses generally occur during an illness, it limits one's ability to work, leading to depletion of household savings and unanticipated economic shocks," says IND-RA.

These out-of-pocket expenses could push millions of people below the poverty line. There could be a 10 per cent increase in rural poverty compared to what it was a decade ago, says Mehrotra. He adds: "As much as 26 per cent of the rural population was living under poverty in 2012; we are likely to see a 10 per cent increase this year. When poverty increases at this rate, aggregate demand in the economy collapses. When that happens, the organised sector is impacted." He says the organised sector may be doing well, but going forward as poverty increases and wages collapse, aggregate demand here, too, will remain extremely tepid. This may mean investments will not revive and GDP growth will not get anywhere close to even 5 per cent for the next three to four years.

"The migrants who walked back home in 2020 had some work before they left the cities. They went back with some savings and thus, additional money was injected into the rural economy. The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) also provided employment. This time, unfortunately, several migrants are without work," says Kashyap.

Pravakar Sahoo, professor, Institute of Economic Growth (IEG), an autonomous body under the Union government, says the money in circulation or that with public currently is around ₹29 trillion. "This is 50 per cent higher than the money that was with the public before demonetisation," he says. Why is the demand for money high when jobs and incomes have been lost? Sahoo says these are distressed withdrawals. "People are now withdrawing money. They have lost their income and are now relying on their savings to survive. It's a bad sign. The consumption level will go down further."

**WE ARE STILL STRUGGLING WITH OXYGEN AND CRITICAL CARE BREAKDOWN IN URBAN INDIA. THE SALARIED JOB LOSS IN RURAL INDIA WILL HAVE A CASCADING IMPACT ON SEVERAL SECTORS**

**SUNIL KUMAR SINHA**
**Principal economist, Indian Ratings and Research**

## RURAL ECONOMY FAILS TO HOLD UP

The overall share of the rural economy in GDP is around 30 per cent. Agriculture contributes a third to the rural economy; the rest is contributed by non-farm component that comprise industries and services. Experts says with activities in the rural non-farm sector also almost shut, there is an increase in surplus labour in agriculture. But MGNREGA cannot absorb all the demand for work. Moreover, with COVID-19 making inroads into the villages, a healthy work force may not be available for the rural economy to function, says Arup Mitra, professor, IEG. "The impact on people's incomes and economy is likely to be much worse compared to disasters such as El Niño and droughts."

Most of the non-farm activities—works like repairing auto-rickshaws, cycles and tractors, construction, transport and storage—require high human contact. Rural wage growth for both agricultural and non-agricultural activities has declined recently. "Average agricultural wage growth during

November 2020-March 2021 declined to 2.9 per cent from 8.5 per cent during April-August 2020. Similarly, wage growth for non-agricultural activities during November 2020-March 2021 declined to 5.2 per cent from 9.1 per cent during April-August 2020," says IND-RA.

Even though the economic impact of the pandemic on rural areas was less severe in 2020, the Union government announced various steps, such as a stimulus package that included relief measures. This year, however, there have been no such announcements so far. Sahoo says: "The stimulus package created liquidity in the market. The measures were not perfect, but they worked to some extent. Even many micro, small and medium enterprises (MSMEs) could keep both their men and machinery functioning after the first wave. There is no substantial support in the second wave. So many MSMEs like the cottage industry, which would have tried to stand up after the first wave, are finding it difficult to do so this time." The Union government has provided some relaxation regarding loans through the Reserve Bank of India to MSMEs. But when there is no demand and even the enterprises are not operational, the relaxations are not going to help, he adds.

Economists say the government must now prepare itself to initiate a wide range of schemes for low-income households in rural as well as urban areas. "The urban informal sector and rural non-farm sector will require a great deal of attention for livelihood creation. If not done, it can lead to large-scale consequences. Inequality will increase further, which will not be sustainable," says Mitra. Mehrotra makes a case for an urban employment guarantee scheme, just like MGNREGA for rural areas, and cash transfer to ensure a minimum income guarantee. "Spending funds for an urban employment scheme will ease the burden on MGNREGA and will invite workers back to town," he says.

*(With inputs from Sudarshana Chakraborty)*

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# "A healthy work force will be scarce"

**ABHIRUP BHUNIA**



IN RURAL areas, there might be a tendency to suppress discretionary spending due to the fear of impending disease. Such downward force on consumption and demand was not there last time. Last year, rural demand actually saved us. A health crisis becomes a tremendous pressure on out-of-pocket expenses for any family. So people will try to save much more and cut down on consumption. When a disease hits a family, there is an out-of-pocket expenditure which puts somebody in a real debt kind of situation.

Rural doesn't only mean agriculture. Half of the manufacturing and construction are basically in rural areas. In terms of solutions, there have to be cash transfers. Income support needs to resume because there will be people who due to the suppression of economic activity will not be able to sustain themselves in terms of basic livelihood. Cash in hand will also give a sense of financial security to people in these times. In-kind support in form of ration should be continued.

MGNREGA data suggests heightened distress, as registrations are going up. In May, there is a 50 per cent year-on-year increase in job creation. MGNREGA cannot take up all the demand if it keeps increasing like this. We have to include newer things in the ambit of MGNREGA, at least temporarily. For example, any kind of activity that is required to build health infrastructure. But if the severity and communicability of the disease increases—and we hear that many pockets in villages are being wiped out—a healthy work force will not be available for the rural economy to run.

*(Author is a development consultant)*

# BEHIND THE CURVE

It should not have taken a pandemic for the government to realise the importance of the rural healthcare infrastructure and of universal free access to it

**VIBHA VARSHNEY**

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SARS-CoV-2 virus, which is behind the ongoing pandemic, does not differentiate between rural and urban areas. It just looks for susceptible people, who still do not have the immunity against it. Since rural India remained largely unscathed during the first wave of the pandemic, the virus has found many susceptible victims there during its second wave. An analysis by *Down To Earth* shows that in April, rural districts accounted for 45.4 per cent of the total COVID-19 cases in the country and 50.8 per cent of the deaths. The numbers kept growing through May (see 'Troubled interiors' on *p*34), when rural districts for the first time this year surpassed urban districts in terms of COVID-19 cases and deaths. That month, rural districts accounted for 53 per cent of the total new cases in the country and 52 per cent of COVID-19 deaths.

Owing to the nature of the virus, its spread was inevitable. The current problem emanates from the fact that the rural areas are ill equipped to deal with diseases even in best of times. More than 65 per cent of the country's population lives in rural districts, according to World Bank data. Yet, hospitals in rural areas have just 37 per cent of the beds available in all government hospitals across the country, admits the *National Health Profile of India for 2019*, a report prepared by the Central Bureau of Health Intelligence.

**A HEALTHCARE SYSTEM THAT DOES NOT WORK IN NORMAL TIMES IS NOT LIKELY TO WORK DURING A PANDEMIC AND UNDER PRESSURE**

**RITU PRIYA**
**Professor at the Centre of Social Medicine and Community Health, Jawaharlal Nehru University, Delhi**

The problem also stems from the fact that the country has failed to strengthen its rural health infrastructure, despite repeated warnings and advisories.

A parliamentary committee report on *Management of COVID-19 Pandemic and Related Issues*, presented to the chairperson of the Rajya Sabha on December 21, 2020, indicated the possibility of the disease reaching rural areas. It had advised the government to ensure testing infrastructure and upgraded health infrastructure in remote and rural areas. Earlier, on November 21, another Parliamentary committee report, *Outbreak of Pandemic COVID-19 and it's Management*, submitted to Rajya Sabha highlighted the poor state of primary healthcare in rural areas and recommended that the government increase its spending under the National Rural Health Mission to strengthen the delivery of healthcare services in rural areas during the pandemic.

It was only in May that some action was visible at the central level. On May 16, the Union Ministry of Health and Family Welfare released a standard operating procedure (SOP) on "COVID-19 Containment and Management in Peri-urban, Rural and Tribal areas". The SOP outlined the preparations needed in rural areas and detailed the efforts states needed to take for surveillance, screening, isolation and referral of patients. It



^ COVID-19 patients protest in front of a health centre in Odisha's Angul district, demanding better healthcare

PHOTOGRAPH: BIJAY MISHRA

proposed a three-tier structure—COVID care centres to manage mild and asymptomatic cases; dedicated COVID health centres to manage moderate cases; and dedicated COVID hospitals to manage severe cases.

Implementing the SOP should not have been difficult as India already has a three-tier healthcare system in place—primary, secondary and tertiary. Then where did it falter?

Ritu Priya, professor at the Centre of Social Medicine and Community Health, Jawaharlal Nehru University, Delhi, points out that a healthcare system that does not work in normal times is not likely to work during a pandemic and under pressure. Besides, the SOP document does not reflect any sense of urgency by the Union health ministry for rural India. It begins with the line "COVID-19 outbreak in the country is still predominantly an urban phenomenon", she says.

The SOP document also notes that 80-85 per cent of the people affected by COVID-19 do not need specialised care and can be quarantined at home or at a COVID care centre. However, ensuring treatment to the remaining 15-20 per cent of COVID-19 infected persons requires major upgradation in healthcare infrastructure—community health centres, sub-district and district hospitals and transport facilities—in rural areas. This was unthinkable for a health system that has been strapped for funds for decades now.

India's public health expenditure (a sum of Central and state spending) has

remained between 1.2 per cent and 1.8 per cent of GDP between 2008-09 and 2019-21. This is quite low when compared with other countries such as China (3.2 per cent), US (8.5 per cent) and Germany (9.4 per cent). The National Health Mission, which envisages achievement of universal access to equitable, affordable and quality healthcare services, receives about 50 per cent of the budgetary allocation for health. Worse, the allocations for the rural component (National Rural Health Mission) has decreased by 3 per cent since last year.

Since 2014, the government's focus has in fact shifted to providing healthcare by roping in the private sector. The National Health Policy (2017) also envisages providing healthcare in collaboration with the private sector. The Pradhan Mantri Jan Arogya Yojana (PMJAY), a component of the Union government's flagship scheme Ayushman Bharat, is an insurance-based scheme which has seen the highest increase in allocation for 2020-21 at 100 per cent (₹6,400 crore over the revised estimates of ₹3,200 crore in 2019-20).

The futility of this dependence on private healthcare providers via government-funded insurance schemes has become apparent during the pandemic. The private sector is not active in rural areas, and even the hospitals present refused to provide care to COVID patients during the pandemic. Even state-level insurance schemes did not perform well. Chhattisgarh, for instance, has a universal healthcare scheme, the Khoobchand Baghel Swasthya Sahayata Yojana. During the pandemic, this scheme should have come to the rescue of each COVID-19 infected person, whether in rural or in urban areas. But private hospitals refused to implement it. Instead, several of them found newer ways to overcharge patients by providing plasma therapy and other unscientific and unproven therapies that do no good to patients, reveals Sulakshana Nandi, National Joint Convener of Jan Swasthya Abhiyan (JSA) and co-chair of People's Health Movement, a global network..

**CENTRE AND NITI AAYOG SHOULD ABANDON PLANS FOR PRIVATISING HEALTH CARE, AND INSTEAD INVEST ALL MONEY AND EFFORTS INTO MAKING THE PUBLIC HEALTH SYSTEM STRONG AT ALL LEVELS**

**SULAKSHANA NANDI**

**National Joint Convener of Jan Swasthya Abhiyan and co-chair, People's Health Movement**

The government did not demand services from the private sector though it could have legally done so under the Epidemic Diseases Act, 1897 (just the way Kerala has done). Experiences of the poor say provision of an insurance card is not the same as effective access to free and quality care. Instead of learning from this failure of the private sector to provide any help during the pandemic, NITI Aayog, India's premier think tank, brought out a report *Investment Opportunities in India's Healthcare Sector*, on March 31, 2021, with a focus on private healthcare.

"Going forward, the Centre and NITI Aayog should abandon all plans for healthcare privatisations, such as PMJAY and handing over district hospitals to private medical colleges, and instead invest all money and efforts into strengthening the public health system at all levels," says Nandi.

## LEFT IN SHAMBLES

The major reason public healthcare has failed to perform during the pandemic is the deficiency in infrastructure—both in terms of physical structures and human resources. As of 2018, India faced a shortage of 2,188 community health centres (CHCs), 6,430 primarily health centres (PHCs) and 32,900 sub-centres. The existing ones, too, do not have adequate infrastructure and are poorly equipped. According to an analysis by World Bank, in 2017 India had only 0.5 beds per 1,000 people, far below the global average of 2.9 beds. Small wonder, the rural healthcare infrastructure is now stretched to the limit during the pandemic.

"In some tribal areas of Maharashtra, not a single oxygen bed is available in the entire block. People here had to travel long distances to access medical facilities, without any assurance of a bed. More often than not, their health condition deteriorates on the way to the health

facility," says Abhay Shukla, co-convenor, JSA. The isolation centres which had worked well in the first wave were not revived in the second wave. "In rural areas, it is important to have institutional isolation centres to ensure adherence to COVID-appropriate behaviour," says Shukla.

He says it is easy to bolster health infrastructure during such times of crisis. Potentially, each rural school can be converted to an isolation centre, which can then be monitored by ASHAs and ANMs. This is a public health measure that has to be implemented and supervised with direction from the top authorities. Similarly, each *taluka* in the state has a 30-bed hospital, some of which can easily converted to oxygen beds. "In Chhattisgarh, a number of government facilities got upgraded during the pandemic, and have been doing a very well," Nandi says.

There is also a shortfall in the number of doctors, specialists and surgeons. For example, as of 2018, there was a deficit of 46 per cent of doctors and 82 per cent of specialists, including surgeons, obstetricians, gynaecologists, physicians and paediatricians needed in PHCs across India. WHO recommends 44 health workers per 10,000 population, but India has only 22 health workers per 10,000 population. Rural areas have lower health worker density than the national average.

*The Rural Health Statistics 2019-20*, brought out by the Union health ministry, points out that at the national level, 11 per cent of ANM (trained female health workers) posts at sub-centres were vacant, as were 35 per cent of the sanctioned positions for male health workers. Similarly, 37 per cent of the positions for health assistants and 20 per cent for those of doctors at PHCs were not filled. Even nurses and AYUSH (Ayurveda, Yoga, Naturopathy, Unani, Siddha, Sowa-Rigpa and Homoeopathy) practitioners were short by 13 per cent and 9 per cent respectively. The most basic health

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## "The pandemic is worse than disasters that hit rural areas"

**ARUP MITRA**



WHAT'S HAPPENING to rural livelihoods is much worse than other disasters affecting rural areas, like drought. This time around, there are no schemes or announcements to start demand, like last year. Currently the attention is more on controlling the disease and keeping people inside so that the disease doesn't become widespread.

We don't know how long this lockdown will last and the health infrastructure in the rural areas is really fragile. Given this situation I really don't know see how MGNREGA can come to rescue in a greater extent. In particular, when the disease has taken a deep-rooted shape, I don't know how activities under MGNREGA, especially construction and infrastructure, which are not very essential and can wait, would be allowed.

There will be a major deceleration in employment and income, which is going to affect the economy significantly. The problem is going to aggravate much faster. Last time the extent of the decline was arrested due to rural demand. This time it looks like it's very difficult to arrest the deceleration. The income loss is tremendous compared to what was experienced last year. The rural non-farm sector is very bleak. It's very difficult to see a silver lining. At least some part of the rural non-farm sector was functioning last year, but those possibilities are almost negligible now.

Even if the economy opens up, it is not going to do so in a significant manner; it is going to be in a very narrow way because people are scared now. So from that point of view, it's a major blow on the economy from both the health and the employment aspects.

*(Author is a professor at Institute of Economic Growth)*

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workers are missing even in a rich state like Maharashtra, where the number of sanctioned positions for ANMs at the sub-centre level was 11,975, of which only 10,492 posts were filled. Poor states like Uttar Pradesh and Bihar,as classified by the number of people living below the poverty line under the NITI Aayog's SDG India Index for 2019, were worse off. While in Uttar Pradesh, out of the sanctioned 23,656 posts, only 20,389 were filled, in Bihar, only 13,425 posts out of the sanctioned 20,544 were occupied.

ASHAs and other frontline workers worked well during the first wave of the pandemic, but as they were not adequately protected, many got COVID-19. ASHAs in Pune, Maharashtra, have not been paid or remunerated for the extra work they are doing, reveals Shukla. Mitanins (female health volunteers) in Chhattisgarh have been working non-stop in the community since the pandemic began, but they have neither been remunerated nor provided adequate protective equipment, says Nandi. So they are demoralised, discouraged, sick and scared during the second wave.

## STRENGTH IN COMMUNITY

However, these community level workers are needed to improve India's response to COVID-19 and improve health basics. Some states have made an effort to improve the working of rural workers. For example, on May 17, 2021, the Odisha government issued a directive to provide a one-time support of ₹10,000 to ASHA workers to purchase protective equipment to help them work safely. "Health cannot be produced, it can only be co-produced— the public health system and people have to work together. Co-production of health is imperative in time of a pandemic. Everyone has to be mobilised," says Shukla.

The non-degree holder rural doctors too need to be included in this fight, says Ritu Priya. These practitioners provide healthcare to over 80 per cent people in rural areas. Some states like West Bengal have woken up to this potential. The state government is now enlisting these healthcare providers who are being officially recognised as *grameen swasthya parisevaks* and being trained to contain the spread of COVID-19 in rural areas, particularly to counsel the increasing number of patients in home isolation.

SATHI, or Support for Advocacy and Training to Health Initiatives, a Pune-based non-profit, has set up 30 help desks during the second wave to guide patients on where to go for tests and vaccinations, and what treatment to avail. This is of huge help as the existing staff is preoccupied with clinical care, and it can be easily set up across the country.

States like Kerala, that have had some experience with pandemics, have fared better in COVID-19 control due to participation of civil society in outbreak control and health service delivery. Team building among frontline functionaries and community leaders was spontaneous without any political or religious barriers as people had experience through the previous outbreaks of H1N1 in 2009, Nipah in 2018 and leptospirosis in 2019. "Mobilising volunteers who are ready to go the extra mile was a deliberate strategy adopted by Kerala since 2008 through the People's Campaign for Decentralised Planning," says Antony KR, a Kochi based public health expert and an independent monitor of the National Health Mission. Because of this, 45,000 registered volunteers are now helping the Kerala government in COVID-19 control activities. They are in addition to 26,310 ASHA workers, 33,115 *anganwadi* workers, and 4.54 million women entrepreneurs under the banner of Kudumbashree, a scheme for neighbourhood women groups. Another 21,682 elected ward members from village *panchayats*, municipal corporations or councils, too, have joined this army of unpaid workers to tackle the pandemic. Over the past year, these volunteers have played a crucial role in tracing and

**HEALTH CANNOT BE PRODUCED, IT CAN ONLY BE CO-PRODUCED —THE PUBLIC HEALTH SYSTEM AND PEOPLE HAVE TO WORK TOGETHER. CO-PRODUCTION OF HEALTH IS IMPERATIVE IN TIME OF A PANDEMIC**

**ABHAY SHUKLA**
**Co-convenor, Jan Swasthya Abhiyan**

isolating the infected persons at airports, railway stations, inter-state borders and bus terminals; running community kitchens to feed quarantined people, especially the elderly, patients in isolation hospitals, the poor and the homeless; and to distribute dry ration kits, Antony explains.

Ritu Priya points out that India can fight the pandemic successfully only with a decentralised approach. The entire government and the whole society must come together and take action, keeping local-level conditions in perspective. In Dharavi, the government machinery worked, but the community also participated actively. The private sector does not have a role in pandemic control as it is not likely to do contact tracing or go to rural areas.

As of now, vaccines appear to be the only way out of the pandemic. These would be especially useful in rural areas where healthcare is patchy.

## VACCINE CONUNDRUM

Ideally, the COVID-19 vaccination programme should have been a success in India, which is not only a global leader in vaccine development but also has an existing universal immunisation programme in place. But in its attempt to address the issue of vaccine shortage amid the second wave, the government has instead introduced new strategies that have now resulted in unjust and lopsided distribution of the vaccine.

While rolling out the COVID-19 vaccination programme, the Centre had sanctioned ₹35,000 crore, which is enough to purchase a vaccine for every citizen above 18 years of age. On December 28, 2020, it also released the COVID-19 Vaccines Operational Guidelines to ensure a smooth rollout of these vaccines. But deadlines were not set, and all that was mentioned was that everyone who is eligible for the vaccine would get it. The guidelines aim to vaccinate some 300 million people—healthcare workers,

AFTERSHOCKS#COVID-19

# "Those who have gone back to villages have no work, so no income"

**PRADEEP KASHYAP**



THIS TIME the impact will be much worse. Last year when the rural workers returned home, they at least had work before they left the cities. So they left with some savings. It was rural India that saved us last year. Labourers had the cash in hand and thus there was additional money injected into the rural economy. This time, unfortunately, several of them still continue to be without work and most of them have gone back without savings, so there is no extra infusion in the rural economy.

The economy is battered. It's going to take a long time to get the jobs back, to get the incomes going, so there is not going to be consumer demand. This time around, the rural economy is going to be a drain on the country. I do not, therefore, see too many silver linings with regard to the economy.

CMIE data shows that the employment in agriculture has gone up. In the last 10 years it had been decreasing steadily by 1-1.5 per cent. But now, suddenly, it has risen from 43 per cent to 46 per cent. This is because there is a high level of disguised unemployment in rural areas. All the people who have returned have no work to do and are with their families. So they identify themselves as being in agriculture or as agriculture labourers, but they are not actually productive or they don't make a major impact.

*(Author is founder, Rural Marketing Association of India)*

AFTERSHOCKS#COVID-19

# "People are withdrawing money in distress, dipping savings"

PRAVAKAR SAHOO



MOST OF the people in rural areas have lost their income and employment. This time, the government and policy makers are caught off guard. They cannot focus on anything else other than beds, oxygen, among other things. Last year recovery was quicker because of the fiscal stimulus and other measures. They might not have been perfect, but they still worked to some extent. Allocation to the rural sector was given importance last time, and so the rural economy somehow recovered. This time, the announcements are only restricted to food through PDS. But that is for subsistence, not for recovery. The government has given some relaxation regarding loans through RBI to MSMEs, but when there is no demand and your enterprise is not operational, all these relaxations are not going to help.

Today, the money in circulation or the money with the public is ₹29 trillion. This is 50 per cent higher than before demonetisation. At a time when jobs are lost, income is not there, growth is not happening, the demand for money is high. Why? This is because people are taking out cash. This simply means these are distressed withdrawals. People are taking out their money, they are in a precarious situation, they have lost income and now they are taking out their savings to survive. It's a bad sign. The consumption level will decrease further.

*(Author is a professor at Institute of Economic Growth)*

frontline workers, those above the age of 50 years and those who have co-morbidities—by July 2021. The vaccination drive was then opened up for people aged 45 years and above on April 1, 2021. With the second wave, the demand for vaccines increased and shortages were evident on the ground. But the government did not have a plan to meet this demand.

On April 19, 2021, the government unveiled the Liberalised and Accelerated Phase 3 Strategy, according to which states and private hospitals could procure half of the vaccine produced in the country. The manufacturers were allowed to sell these doses at a higher price. Now, those above 45 will receive the central quota and this can be dispensed for free to the population. The states could provide vaccines to those citizens they consider vulnerable, while the private industry could vaccinate all those who do not necessarily fall in the vulnerable category but have the purchasing power.

This strategy has led to chaos and confusion on the ground. Bharat Biotech has announced that it would sell its vaccine, Covaxin, at ₹400 per dose to the states while Serum Institute of India (SII) has set price for its vaccine, Covishield, at ₹300 per dose. While SII has set the price at ₹600 per dose for the private players, Bharat Biotech has not revealed its price. These higher prices have resulted in an increase in the price of vaccine at private centres, where Covaxin is available at ₹1,250 and Covishield at ₹900.

Since neither of these companies have enough vaccines to meet the shortages, states have tried to issue global tenders to expedite the vaccination process. Uttar Pradesh, with a population of more than 200 million, floated a tender for 40 million doses of the vaccines on May 7. A couple of days later, the Municipal Corporation of Greater Mumbai (MCGM) invited expressions of interests to supply 10 million shots. Many other states, including Delhi, have also floated similar tenders. But these states have not been



Designated COVID Healthcare Centre in Godhra, Gujarat. Such makeshift facilities are not nearly enough do deal with the rising caseload

PHOTOGRAPH: JUMANA SHAH

successful in procuring vaccines through the tenders. "Things that should have been decentralised have been centralised and vice versa," rues Shukla. "We have a decentralised system for vaccine procurement but a centralised system for vaccine administration."

The companies and the government are now trying to increase production too. As Covaxin is indigenous and developed by the Indian Council for Medical Research, it is possible to licence the technology to multiple manufacturers. Some efforts have been made regarding this and facilities at three public sector vaccine manufacturing units are being ramped up so they are able to manufacture soon. Bharat Biotech, too, is increasing capacity.

Taking *suo motu* cognisance of the development, on May 31 the Supreme Court has also questioned the Centre about its vaccine procurement policy and different price mechanisms for the jab. So far, all the vaccines for India's universal immunisation program were procured by the Centre alone and administered by the states free of cost, as per the established universal immunisation programme.

**HOSPITALS IN RURAL AREAS OF INDIA HAVE JUST 37 PER CENT OF THE BEDS AVAILABLE IN ALL GOVERNMENT HOSPITALS ACROSS THE COUNTRY**

**NATIONAL HEALTH PROFILE OF INDIA FOR 2019**

**A report by the Central Bureau of Health Intelligence**

The pandemic is an indicator of India's failure in providing healthcare to all in the country. Now, years of incremental improvements in health indicators in rural areas are lost as routine surgeries, antenatal care and immunisation coverage, dialysis and care of the kidney patients, routine chemotherapy and radiotherapy of cancer patients are adversely affected. It is a wake-up call and experts hope that some good would come out of this chaos too. For example, this is the first time that all of adult population is reaching health centres for vaccination. These people can be screened for blood pressure and blood sugar and counselled for hypertension and diabetes. These are integral to comprehensive primary care proposed in the National Health Policy, 2017. DTE

@down2earthindia

# The curious case of Covaxin royalties

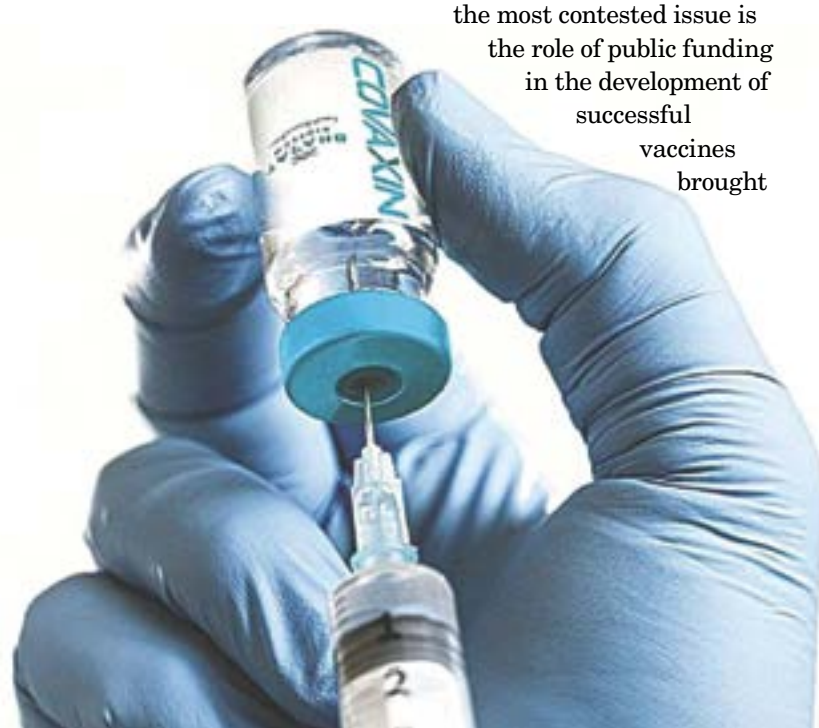
## ICMR's contradictions and obfuscation on ownership of the vaccine's intellectual property is not helping in the fight against COVID-19

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AS ONE of the handful of countries to have produced a vaccine against COVID-19, India ought to be celebrating its achievement. Instead, almost everything to do with Covaxin, the vaccine developed by the Indian Council for Medical Research (ICMR) in partnership with the private vaccine company Bharat Biotech (BBIL), is cloaked in ambiguity. The haziest aspect is ownership of the intellectual property (IP) on the vaccine, and statements by ICMR have only added to the confusion. BBIL has chosen to maintain a studied silence on the subject.

The chronology of research on the SARS-CoV-2 virus in India and the development of Covaxin begs a question: if not for critical work done by public sector laboratories, would the vaccine have been developed by BBIL, and in such a short time?

In the global campaign for wider access to vaccines to fight the deadly COVID-19 pandemic, the most contested issue is the role of public funding in the development of successful vaccines brought to the market. Should private companies be allowed to reap huge profits through the grant of patent monopolies on life-saving vaccines, when much of the funding has come from public research and taxpayer money?




The Covaxin case provokes a similar question. But here the issue is murky. There is no clarity on who owns the rights to the vaccine. The first public disclosure on Covaxin's IP was made to *The Hindu* on May 3, after mounting demands from the scientific fraternity, legal experts and the media seeking details of funding and the IP rights. *The Hindu* report said the product IP is "shared". The public-private partnership, we were told by ICMR director-general Balram Bhargava, was formalised under a memorandum of understanding (MOU) between ICMR and BBIL and the IP was "shared". In an email reply to the newspaper, Bhargava disclosed that the apex health research body would receive royalty payments on net sales from BBIL. To make it amply clear that it was a joint undertaking, he pointed out that the name of ICMR and its National Institute of Virology (NIV) would be printed on the vaccine boxes. NIV is a major institute of ICMR and a designated World Health Organization reference laboratory for the southeast Asia region.

Within days, however, a report in a sister publication, *The Hindu BusinessLine*, had a slightly different version. An unnamed top official privy to the developments was quoted by the newspaper as saying the contract with BBIL was open-ended and ICMR was free to share the technology with other companies. It was entitled to a 5 per cent royalty from BBIL. Note that the word used here is "contract".

Was it, then, a contract manufacturing agreement like that of the Serum Institute of India (SII) with AstraZeneca to produce its Covishield vaccine? In the wake of the deadly spread of the second wave of the pandemic, the government has roped in three public sector vaccine institutes to make Covaxin. But if it has the right to grant to licences at will, the big question is why just choose Haffkine—it was the only one authorised initially—and not every vaccine company in the country that is eligible to make the product?

The latest twist in the Covaxin story came on May 27, when the NITI Aayog published a diatribe against what it terms the "myths" on India's vaccine process. The press note issued by Vinod Paul, member, health, and chair of the National Expert Group on Vaccine Administration for COVID-19, is an angry rejoinder to the criticisms levelled against the Narendra Modi government for its failure to anticipate and prevent the devastating second wave. There is a specific reference to Covaxin, where Paul states categorically that "there is only one Indian company (Bharat Biotech) which has the IP." However, the government is trying to ensure that three other companies start production of Covaxin by December.

**The story of how Covaxin was developed in India is lacking in critical details, especially with regard to the role of public laboratories**

Why just three, is the question, as India runs out of vaccines and vaccination centres turn away desperate people? It must be remembered the Covaxin accounts for just 10 per cent of the supplies, while the rest comes from SII's Covishield.

The development of Covaxin, although it provided the right fodder for vaccine nationalists in the country, in particular the cheerleading media and the ruling party speaking heads, is singularly lacking in critical details. The first announcement is a single-paragraph press release by ICMR in May 2020 that it had partnered with BBIL to develop a fully indigenous vaccine for COVID-19 using the virus strain isolated at NIV, Pune. The strain had been successfully transferred to BBIL.

There are other public research institutes which played a signal role in the making of Covaxin. One such is the Indian Institute of Chemical Technology (IICT), a constituent laboratory of the Council of Scientific and Industrial Research. It was only because of the technology developed by IICT for a synthetic route for the agonist molecule that allowed BBIL to scale up the production of the adjuvant. The technology using indigenous chemicals "at an affordable price and with highest purity" was a signal contribution, and BBIL acknowledges that Covaxin would not have been possible without it. One wonders how the technology was given to a private company. Was a licence fee involved, or was it a free transfer?

Public sector labs have been at the forefront of the science to contain the pandemic. In May 2020, another premier research institute, the Centre for Cellular and Molecular Biology (CCMB) in Hyderabad, announced that it had established stable cultures of the coronavirus causing COVID-19. The ability to culture the virus in a lab was a milestone that would enable CCMB to work towards vaccine development and test potential drugs to fight COVID-19, it said in a presser.

Given this background, one wonders why BBIL was given the Covaxin IP and an exclusive contract initially to manufacture the vaccine. Surely, the public health crisis in the country warranted a different approach? In an affidavit to the Supreme Court, ICMR outlined the research steps it had taken to develop Covaxin and the money it spent on the project. But full disclosure of the terms of the MOU it signed with BBIL remains out of public scrutiny.

As serologists warn of the certainty of a third wave of the pandemic, the government must come clean on how it plans to step up vaccine production to meet the threat. Can it walk its talk at the World Trade Organization on the need to waive patent rights in a public health crisis, and make the technology for Covaxin freely available? Or is its vision of Atmanirbhar Bharat limited in scope? DTE

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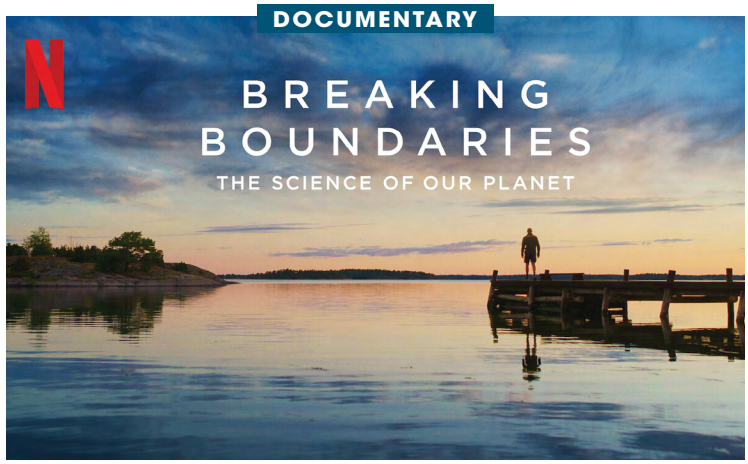
# Palette

## WHAT'S INSIDE

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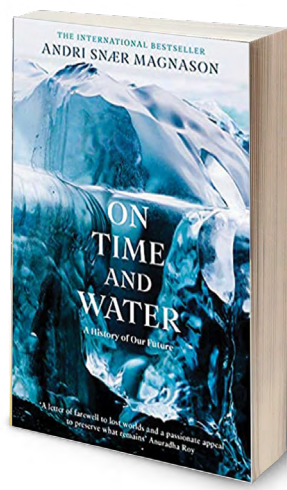
## RECOMMENDATIONS

### DOCUMENTARY

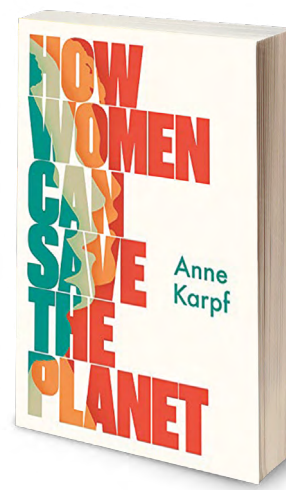



"As we increase our pressures on the Earth, we are crossing irreversible tipping points," says David Attenborough, world renowned broadcaster in the trailer for a new Netflix documentary, *Breaking Boundaries: The Science of Our Planet.* Narrated by Attenborough, the documentary follows Swedish academic Johan Rockström, a global expert on sustainability, as he decodes how humanity has pushed the natural limits that have kept the Earth stable for 10,000 years. He also provides hope, detailing the steps we must take this decade to save our home. *Breaking Boundaries* will stream on Netflix from June 4.

### BOOKS




As the Earth rapidly goes through changes that have not been seen for over 50 million years, natural phenomena like glaciers may soon become extinct. This is the message Icelandic author and activist Andri Snær Magnason wanted to share in his "Letter to the Future", a eulogy for the lost Okjökull glacier in 2019. Now, through his new book, *On Time and Water,* Magnason attempts to learn how the planet reached this point by understanding climate science through ancient myths, personal anecdotes and interviews with the Dalai Lama.




As world leaders scramble to put together green new deals to save mankind from climate crises, the voice of women is lost in the milieu. From young African girls dropping out of schools amid droughts to elderly European ladies dying from heatwaves, women are suffering the most due to climate change. In *How Women Can Save The Planet,* sociologist and journalist Anne Karpf not just shines a spotlight on women conservationists across the world but also calls for global climate policies that are gender inclusive and promote equality.

# TINKER, TAILOR

## WHY THE HISTORIC HIKE IN SUBSIDY OF A WIDELY USED FERTILISER IS INDICATIVE OF A REGIME THAT FOSTERS INEFFICIENCY AND INEQUITY, AND IMPACTS ENVIRONMENTAL SUSTAINABILITY

**JUGAL MOHAPATRA AND SIRAJ HUSSAIN**




ILLUSTRATION: RITIKA BOHRA / CSE

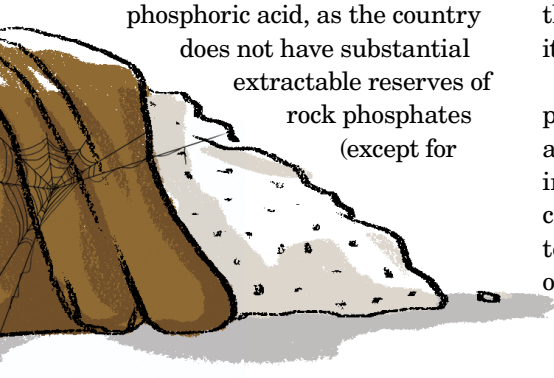
IN THE first fortnight of April, in the midst of the din and bustle of the elections to state legislative assemblies, some leading newspapers reported about an imminent steep rise in the prices of DAP (di-ammonium phosphate) fertiliser to ₹1,900 from ₹1,200 per bag of 50 kg. Against the backdrop of the surging second wave of the COVID-19 pandemic in rural hinterland, the price rise was feared to impact the ensuing kharif crop and aggravate distress in the farm sector even further. Not only is DAP the second most commonly used fertiliser in the country after urea, farmers usually apply it just before or at the time of sowing as its high phosphorus (P) content stimulates root establishment and development. Unsurprisingly, the Union government moved in and announced a "historic" 140 per cent hike in the DAP subsidy, raising it to ₹1,200 from ₹500 per bag so that farmers continue to pay the same price and are not burdened with price rise.

While the political and economic rationale of this move is understandable, it is necessary to analyse

the factors that drove the hardening of DAP price in the domestic market, and whether the move of the Union government signals any intent of the much-awaited structural reform in the fertiliser subsidy regime.

Before analysing these, let's get some basics clear. India's annual consumption of chemical fertilisers is around 60 million tonnes, of which 32-33 million tonnes (about 55 per cent) is urea, which has a high nitrogen (N) content. The remaining varieties consist of DAP, a phosphatic fertiliser, muriate of potash or MOP, a high potassium (K) fertiliser, and other complex fertilisers (with different formulations of nutrients like N, P and K). Among these non-urea fertilisers, DAP accounts for 9-10 million tonnes or about 15 per cent of the total chemical fertilisers consumed in the country.

While domestic production meets 75 per cent of the country's urea requirement, it caters to only 40 to 50 per cent of the DAP needs. The actual output of DAP is even lesser: though its domestic installed capacity is reported to be 10 million tonnes, annual output has veered around 4-5 million tonnes. Thus India is heavily dependent on imports to meet its DAP requirement. More significantly, even for domestic production of DAP, India largely depends on imports of intermediate inputs, such as phosphoric acid, as the country does not have substantial extractable reserves of rock phosphates (except for small reserves in Rajasthan). In such a scenario, the trend in the price of DAP and its inputs in the international market inevitably determine the trajectory of the price in the domestic market.



It is evident from the global market trends that the price of DAP was stable in the first quarter of financial year 2020-21, after which it started moving northwards, registering a rise of 78 per cent between July 2020 and April 2021. Similarly, the producer price index (PPI indicates the average fluctuation in selling prices) of phosphoric acid and other intermediates of phosphatic fertilisers increased by about 50 per cent during this period (see 'Global pressure on DAP rate'). The price movements in the global markets exerted pressure on the domestic market, which led the Indian Farmers Fertiliser Cooperative Limited (IFFCO), one of India's largest fertiliser producers, to announce a 58 per cent price hike for DAP on April 8.

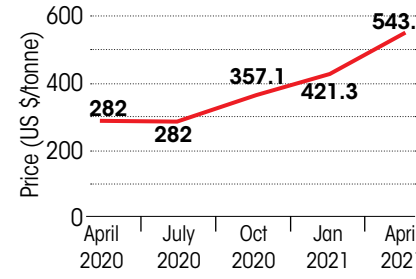
The announcement, as expected, triggered a clamour of protests, prompting the Union government to step in the very next day and "persuade" the domestic producers to hold back any increase in the fertiliser prices. Just the way the domestic producers of DAP could not have postponed the price hike, the Union government could not have risked an increase of 58 per cent in the retail price of DAP even though it is a "decontrolled" product.

First, an increase in the retail price of DAP would further accentuate the problem of imbalanced use of fertilisers in the country, which is already skewed towards nitrogenous urea; the use of phosphatic and potassium fertilisers has been sub-optimal in several regions.

Second, such a steep price hike would most certainly affect the 2021 kharif crop. This means

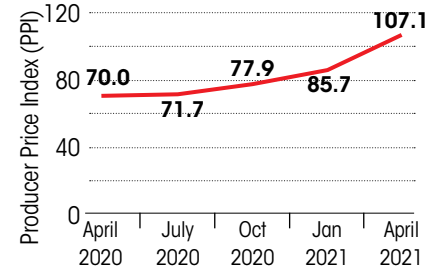
## GLOBAL PRESSURE ON DAP RATE

Price of DAP fertiliser in the world market has started moving northwards since the second quarter (Q2) of FY 2020-21




Source: IndexMundi

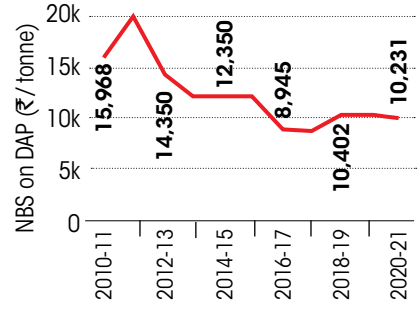
PPI* of phosphoric acid, other phosphatic fertiliser materials has increased by 50% in world market since Q2 of FY 2020-21




Source: Federal Reserve Economic Data (FRED)
Note: PPI indicates average fluctuation in selling prices

## DIMINISHING COMFORT AT HOME

Nutrient-based subsidy on DAP fertiliser has fallen over years with occasional increase during high global prices




Source: Department of Fertilizers, Government of India

despite a favourable forecast of monsoon this year, the prospect of a buoyant farm sector and rise in farmers' income would be rather gloomy, dampening the much-expected recovery of the economy during financial year 2021-22.

Third, a large number of farmers in different parts of the country have been agitating against the three farm laws, hurriedly enacted in September 2020. A steep hike in the price of DAP, would have added to the discontent among the farmers across India.

Thus, the only option left for the Union government was to counterbalance the anticipated price increase by offering a higher subsidy. Does this indicate any comprehensive reforms in the fertiliser sector, at least in the medium-term?

## NOT REALLY

Prices of chemical fertilisers in India are regulated through two subsidy regimes—one for urea and the other for phosphatic and potassium fertilisers. For urea, which is a "controlled" fertiliser, a "fixed price, variable subsidy" policy is in place, under which the Union government fixes the retail price and producers are provided subsidy (which varies from plant to plant) to cover their normatively estimated cost of production.

Since 2010-11, the prices of "decontrolled" phosphatic and potassium fertilisers are governed under the "nutrient-based subsidy" (NBS) policy to promote their consumption so that a balanced fertilisation of the soil can be ensured. Under NBS, the Union government provides a fixed subsidy per kilogramme of nutrient. Domestic suppliers are allowed to fix their prices "reasonably", after factoring in the NBS rates, which vary every year and are decided by the Union government after taking into consideration price trends in the global market.

It is, however, observed that NBS on DAP has actually fallen over the years, from a peak of ₹19,763 per million tonnes in 2011-12 (average landing price of imported DAP during 2011-12 was US $512 with a peak of $598 in July 2011) to around ₹10,000 in the past three years (see 'Diminishing comfort at home', *p*83). The government has provided higher subsidy under NBS only in exceptional circumstances, like the one witnessed during 2011-12 when the global prices were unusually high, to ensure that the retail prices for farmers remain stable and price hike is modest.

**OWING TO THE COMPLEX WEB OF CONTROLS AND REGULATIONS, PRICES OF DIFFERENT FERTILISERS ARE SEVERELY DISTORTED, LEADING TO WIDESPREAD IMBALANCE IN THE APPLICATION OF CROP NUTRIENTS**

When viewed in this perspective, the recent decision is "historic" in so far as the NBS rate on DAP is the highest offered by the Union government. But it also marks a "continuity" in approach, in which the NBS rate has been calibrated only to insulate farmers from high volatility of global prices. It may be noted that soon after announcing its plan to hike NBS for DAP, on May 20 the government also increased the NBS rate for phosphorus (to ₹45.32 per kg from ₹14.88) in other NPK-based complex fertilisers. But the rate of subsidy remains unchanged for other nutrients. There has been no hike in NBS rate for MOP whose rates, too, have surged.

As per the government's estimates, the revised subsidy on DAP and other complex fertilisers would entail additional budgetary outgo of ₹14,775 crore in 2021-22 (for kharif season only). Going forward, it can be assumed that even in rabi 2021-22, the retail prices of DAP will not be allowed to rise too much. To what extent this budgetary outgo will help ensure holistic use of fertilisers however, remains unclear.

It is well known that owing to the complex web of controls and regulations, prices of different fertilisers are severely distorted, leading to persistent and widespread imbalance in the application of crop nutrients. Various reform options such as bringing urea under the ambit of NBS, complete dismantling of the current input subsidy regime and switching over to direct benefit transfer (DBT) have been under discussion since 2014-15. However, the political complexities of these reforms have so far stalled such reform, despite persistent recommendations of experts. As a result, a fertiliser subsidy regime that fosters inefficiency and inequity, besides adversely impacting environmental sustainability, continues with occasional tinkering. DTE

@down2earthindia

*(Jugal Mohapatra is former Union fertiliser secretary. Siraj Hussain is former Union agriculture secretary)*

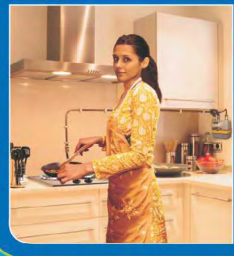
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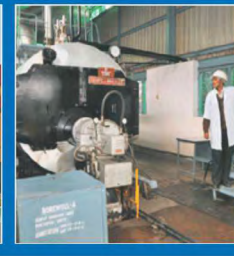
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# OF ALL THINGS TRANSMISSIBLE

A VIRTUAL EXHIBITION, *CONTAGION*, EXPLORES THE TRANSFERENCE OF IDEAS, EMOTIONS AND DISEASES

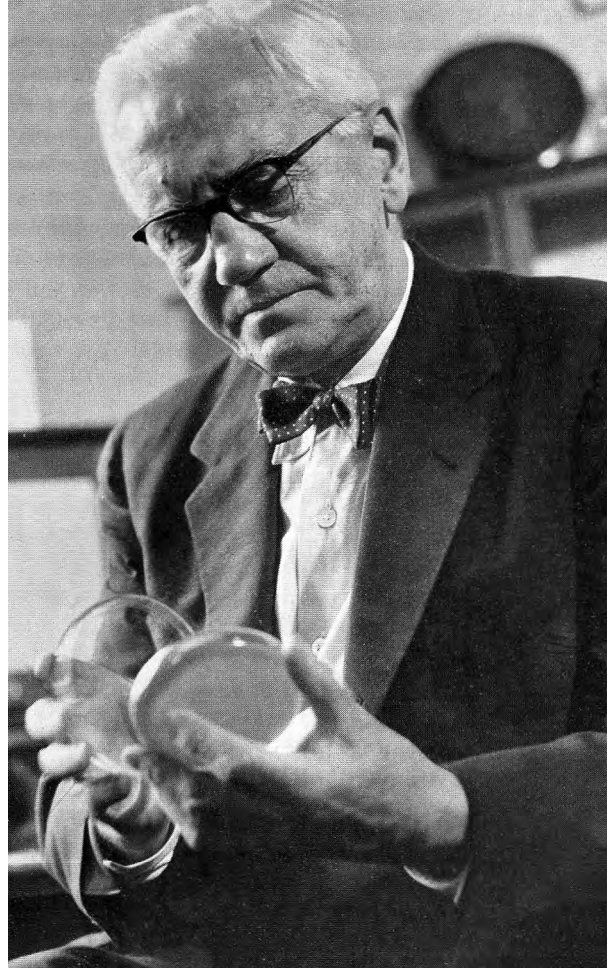
**DAKSHIANI PALICHA** NEW DELHI




**CONTAGION**
Science Gallery Bengaluru
**Available till June 13 on**
***www.nowtransmitting.com***

PHOTOGRAPHS COURTESY: SCIENCE GALLERY BENGALURU





(Left) An ant fungus garden, which scientists from the UK's John Innes Centre use to study how ants fight pathogens with antimicrobial resistance. Their findings are the basis for the exhibit, *Putting The Ant Into Antibiotics*, featured in *Contagion*; (Top) An image from the Wellcome Collection of Alexander Fleming, the Scottish scientist who discovered penicillin. Fleming warned of antibiotic resistance as early as 1945, as proved by a clip of his speech in the exhibit *Moulding Modern Medicine*

The first impression one gets upon entering the website is of being flooded with an overwhelming bank of resources. An online, interactive exhibition, *Contagion* seeks to capture the times we live in by exploring themes and perspectives ranging from medicine to art to history. It does so by delving into different kinds of transferences—emotions, ideas and diseases, with a special focus on medicine and COVID-19—through drawings, games, audio clips, videos and images.

The exhibition can be compartmentalised into different "experiences", the central attractions being a set of 16 exhibits on contagions and programmes (lectures, workshops and masterclasses by subject experts) on understanding diseases. There are also audio-visual elements—short films, games recommended books and audio lists—that act as "buffers" to the 16 exhibits. The COVID-19-specific elements include short explainers or "CO-VIDS" by science and public health experts, and selections of photographs (*Through Your Eyes*) and writings (*In Your Words*) on life amid the COVID-19 lockdown and the pandemic.

The idea behind such a comprehensive set of resources is to give the visitor different points of entry into the exhibition, explains Jahnavi Phalkey, one of the curators of *Contagion* and director of Science Gallery Bengaluru, a non-profit company that organised the exhibition. There is no deliberate order or narrative for the main exhibits, she says, but as a viewer one can loosely classify them into disease, technological and emotional contagions.

The artists and curators need commendation for employing a different interactive medium for each exhibit, making great use of the virtual nature of the exhibition. This is the most evident in the disease section's *A Cluster of 17 Cases* by artist group Blast Theory, which allows you to "live" as one of the 17 people who contracted Severe Acute Respiratory Syndrome (SARS) on February 21, 2003 while staying on the 9th floor of the Metropole Hotel in Hong Kong. The experience is shot inside a scale model of the floor by choosing which room you want to stay in and, *à la* Netflix's interactive special *Bandersnatch*, you retrace the steps of the respective guest, trying to determine exactly how they contracted the disease.

There is also artist Ranjit Kandalgaonkar's *Drawing the Bombay Plague*, a digital mural that joins different anecdotes and trends seen in the disease-infested Mumbai of the 1890s. One can select specific drawings and read their back stories—a treat for fans of scientific and colonial history like yours truly.

## GLOBAL COLLAGE

*Contagion* is the second virtual exhibition since 2020 organised by the Science Gallery Bengaluru. The current edition has been launched with the help of organisations such as the Robert

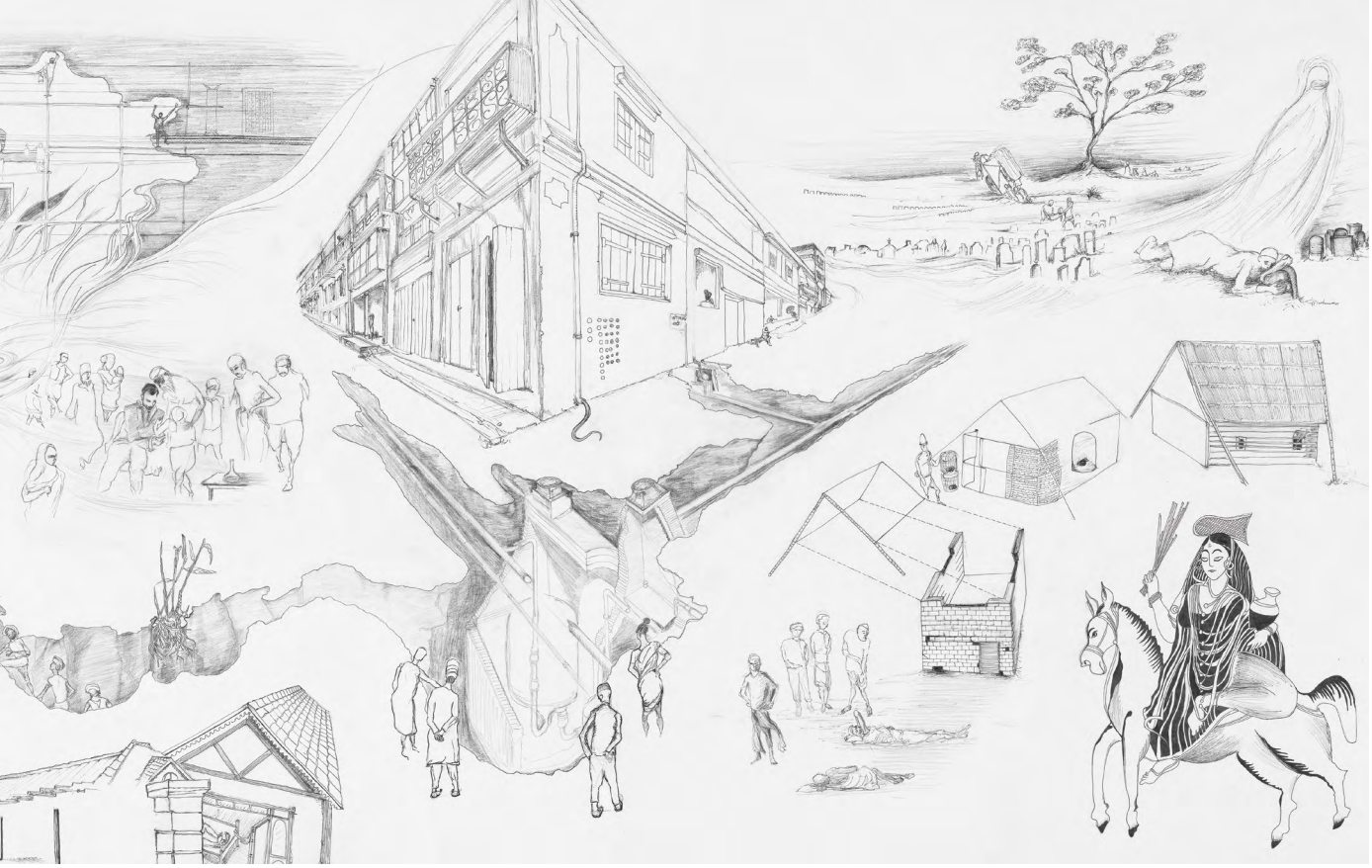


(Clockwise from top) *Drawing the Bombay Plague* by Ranjit Kandalgaonkar, a digital mural that joins anecdotes from the disease-infested Mumbai of the 1890s; A conceptual image of playing "contagious" laughter into the Earth by French artist Anaïs Tondeur; A scale model of the 9th floor of the Metropole Hotel, Hong Kong, where 17 guests contracted SARS on February 21, 2003. *A Cluster of 17 Cases,* an interactive exhibit by artist group Blast Theory, was shot entirely inside this model to give the viewer an experience of "living" as one of the guests to determine how they contracted the disease



Koch Institute, a German federal government agency and research institute; the John Innes Centre, an independent bioscience research institute based in the UK; the DBT/ Wellcome Trust India Alliance, a Hyderabad-based public charity involved in health and biomedical research; and the Indian National Science Academy, among others. The influence of the multiple partners and perspectives is evident across all layers of the exhibition. For instance, in *Putting The Ant Into Antibiotics*—an exhibit in the disease section, which focuses on relatively recent problems like antibiotic resistance—scientists from the John Innes Centre investigate how ant colonies fight antimicrobial resistance. In *Moulding Modern Medicine*, which is a short audio clip of Alexander Fleming's speech on penicillin in 1945, the Scottish physician is prophetic in warning against "someone who has a simple sore throat treating himself inadequately and educating the microbes to resist the drug".

The most abstract exhibits are those dealing with transmission of emotions, due to their rather






conceptual themes. *When The World Was A Laugh* by French artist Anaïs Tondeur is the most offbeat of the 16 main attractions. The exhibit plays on the contagious nature of the activity by tracing the reverberating effect of different laughs collected weekly across the world. The technology-related exhibits, on the other hand, have their themes portrayed quit clearly and are fun to engage with since they have the advantage of using online tools. In *Malware Museum,* through videos, cyber security expert Mikko Hypponen simulates takeovers of your system by some "happy" computer viruses of the 1980s and 1990s (these were not intended to be malicious, just caused disruptions and were considered an expression of creativity of programmers learning how to hack); while *The Glass Room: Misinformation Edition* from international non-profit Tactical Tech decodes how "deep-fakes" are made and shared to spread "contagious" fake news.

The other attractions of *Contagion*, too, are fascinating. For instance, *The Periwig-Maker*, a 1999 German stop motion animated movie included in the short films, provides a heart-wrenching glance into the 19th century plague-infested London.

In these pandemic times, when finding a distraction from the monotony of isolation and lockdowns is a struggle, *Contagion* offers an engaging and safe outlet, and succeeds in starting a discussion on the transmissibility of things. DTE

@dakshipalicha

# Odisha model for survival

I WAS born in Khariar, a small town in Odisha's (then Orissa) undivided Kalahandi district, in 1971. My mother often reminds me that I was born in a disaster and continued to live with many of them. This part of the state—Kalahandi-Balangir-Koraput or KBK—is known for chronic droughts and hunger deaths. My birth year was a drought year; over the next five years, the district witnessed four more severe droughts. My earliest childhood memories are often of disasters. One is that of a skeletonised woman, who trudged kilometres after hearing about a community kitchen set up by my father and his colleagues and then died of starvation in front of our house. Another one was a desperate crowd scavenging for food in what seemed like a garbage dump, which I saw on my way to school for the first day of formal education.

India knows Odisha for disasters. Half of the country's prime ministers have visited the region only after starvation deaths and droughts made those rare headlines in the national media. In my 50 years of living, I count 49 years of disasters, often contrasting: droughts, famines, cyclones, heat waves and floods. In October 2001, I wrote an article on why the state has been disaster-prone and why there is no governance focus except for temporary and insufficient relief operations. During the four years prior to this, calamities had claimed more than 30,000 lives. "Floods, cyclones, heat waves and droughts have made Orissa the disaster capital of India." I wrote. I interviewed Chief Minister Naveen Patnaik; it remains by far my shortest interview. "Orissa is endemic to calamities and depressions in Bay of Bengal can't be whisked away," he said. His terse answer prompted me to write: "For the people of Orissa it is a circus of death with a misguided ringmaster."

Last month, cyclone Yaas hit Odisha. It was the fourth consecutive severe storm to have hit the state in as many years. Patnaik is still the "ringmaster" but disasters are no more a "circus of death". Rather, with every cyclone and drought, one hears about an "Odisha model" with the hallmark outcome: "reduced loss of human lives". For most of the recent cyclones, the death toll has been in double digits. Drought is still chronic, but we rarely hear about starvation deaths. Heat waves no longer take our lives. How has this been made possible? The answer is a huge investment of political capital.

Patnaik came to power in 2000 as people's mandate against the utter failure of the then Congress chief minister Giridhar Gamang in managing the super cyclone of 1999; it had killed over 10,000 people. Patnaik invested in disaster management in two ways: preparedness and immediate relief. An expansive system was put in place that gets activated at the first warning of any disaster, from cyclone to flood to heat wave. Today, 1,250 coastal villages have early warning systems for cyclones and tsunamis, and 450 cyclone shelters managed by communities. Every year the state undergoes the country's most stringent preparation for heat waves that last up to three months. Over 80 per cent of Odisha's population is covered under a highly subsidised foodgrain scheme, for which Patnaik has ensured an effective public distribution system (PDS). From villages and districts up to the state-level, Odisha's disaster preparation machinery runs more efficiently than the usual administration. All this is for an outcome that is politically non-negotiable: no human loss. The memory of the 1999 cyclone still haunts many Odias, but it also directs political leadership by giving a dire warning about what happens when the government lets people die in a disaster, through the fate of Gamang. DTE @richiemaha

**It's important to remember what happens when a government lets people die in a disaster**

ONLINE TRAINING PROGRAMME ON

# "CEMS and CEQMS- Technology selection, its installation, Data Handling and its Audit Methodology"



**Course Date:** July 14-27, 2021
**Last Date to Apply:** July 9, 2021
**Course Duration:** Two weeks 20 Hours (10 hours per week)
**Course Platform:** Zoom and Moodle

## BACKGROUND

Installation of Continuous Emission Monitoring System (CEMS) and Continuous Effluent Quality Monitoring System (CEQMS) were mandated by Central Pollution Control Board (CPCB) in 17 categories of highly polluting industries (classified under highly polluting industries) and for common pollution treatment facilities. The purpose of mandating real-time monitoring is to strengthen the monitoring and compliance mechanism in the industries and also to promote the measurement of real-time data, which is to become the basis for regulators to check compliance by the industries in near future. In addition to this, these systems can also help industrial sectors/regulators in process optimization and taking timely corrective measures. Since CEMS and CEQMS are complex and expensive technologies, there are significant challenges and risks associated with their implementation. Therefore, appropriate knowledge and skill development for CEMS and CEQMS becomes most crucial factor for industries, regulators and other stakeholders.

Furthermore, in order to ensure proper implementation, auditing of these real-time technologies is an essential factor in improving the systems already installed in the industries. So this programme will also lay focus on audit methodology, which ensures correct implementation of the real time monitoring of emissions and effluent in an industry, to check whether stated standards and other regulatory requirements are being followed, status of facility's compliance, certification, verification, accreditation of the system, technical acceptance through calibration, quality assurance, generating accurate, reliable and traceable data and other related aspects.

Centre for Science and Environment (CSE) recognizes this need and announces an online course on **"Continuous Emission and Effluent Quality monitoring System and its Audit Methodology"** for environment professionals.

This course will be conducted online through technological learning tools such as technical discussion with experts, recorded sessions from experts, presentations, videos and reading material.

## THE KEY TAKEAWAYS

- Pollution monitoring regulations in India and developed countries like US, Europe.
- PM CEMS Technologies and its suitability and limitations
- Gaseous CEMS Technologies and its suitability and limitations.
- CEQMS Technologies and its suitability and limitations.
- Correct installation, operation & maintenance of CEMS and CEQMS.
- Requirement and procedures of calibration for CEMS and CEQMS.
- Data acquisition, handling and reporting.
- Data interpretation, compliance check and improvement.
- CEMS and CEQMS- Audit Methodology.
- Assessment of monitoring technologies, installation, calibration and maintenance practices while conducting audit.
- Development of CEMS and CEQMS audit questionnaire.

## WHO CAN APPLY?

Industry Professionals, Environmental laboratories professionals, Regulatory bodies, Academic institutions, Consultancies, Researchers Instrument Manufacturers and other interested participants.

## COURSE FEE

Indian participants: **Rs 3500 I** Overseas participants: **USD 100** (per Participant)

## COURSE COORDINATOR

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