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1-15 SEPTEMBER, 2018

# Down To Earth

FORTNIGHTLY ON POLITICS

DEVELOPMENT, ENVIRONMENT AND HEALTH

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## DELUGED

Kerala's worst flood in 100 years exposes several climatic and human fault lines

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# TRAINING ON SANITATION SAFETY PLANNING

Towards citywide water and  
sanitation management

**Date:** October 09-12, 2018

**Venue:** Anil Agarwal Environment Training  
Institute (AAETI), Nimli, Rajasthan



## Background

Sanitation measures across most developing countries tend to incline towards the provision of services and infrastructure for achieving citywide water and sanitation management. Although public health is a key outcome for most national policies and initiatives, approaches specifically streamlined to address this critical component of sanitation are often left out at city level.

Understanding this gap, the School of Water and Waste, AAETI, Centre for Science and Environment (CSE), is collaborating with the World Health Organisation (WHO) for a four day training programme on **Sanitation Safety Planning (SSP)**. This training envisages to establish a pool of national and international sanitation players who will have in-depth understanding of SSP key concepts and principles.

## COURSE COORDINATOR

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SCHOOL OF WATER  
AND WASTE



## SIGNATURE SESSIONS BY

**Mr. Darryl Jackson**

Independent Consultant, WHO

### Day 1

Sanitation Planning: Tools, Approaches and  
relevance of SSP (including field visit)

### Day 2

Describe the sanitation system

### Day 3

Hazards, exposure risks and incremental  
improvement plans for SSP

### Day 4

Control measures and review plans for  
citywide water and sanitation management

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# CALL FOR BUSINESS UNUSUAL

**T**HINK OF God's own country: bountiful and beautiful. It is a land of mountains, rivers, paddy fields and oceans. Now, think of the same country in a world that is malignantly unsustainable, and menacingly climate-risked. In August swollen rivers drowned Kerala. The cost of recovery would be so enormous that it is like re-building the entire state from scratch. And all this has happened because people who live in this land have not cared to protect the environment, aggravating the situation in the time of changing climate.

Kerala was a sitting duck waiting for the disaster to happen. It has some 44 rivers that gush down the Western Ghats traversing short distances—less than 100 kilometres in most cases—before they reach the ocean. It is also located in a high rainfall region. The state is thus one big drainage system.

The 61 dams, located in the forested Western Ghats, are one part of this drainage system. The dams, largely meant for generating electricity, also impound the rainwater. But this time, it rained so incessantly that the term “extreme” has to be re-defined. Kerala received some 771 mm of rainfall just in 20 days; 75 per cent of it was received in eight days. Worse, rainfall was highest in the forested regions of the state; not in the coasts where high rainfall is usually recorded. As a result, the mountains collapsed triggering landslides and claiming lives. But much worse, gates of 29 dams, filled to the brim and threatening to break, were opened. After 26 years and only the third time ever, the gates of one of the largest dams, the Idukki dam, were opened.

The fact is by the end of July, or the middle of the monsoon season, the reservoirs were almost full. Because of the variability in rainfall, dam managers store as much water as they can. They don't release water intermittently and rather wait for the absolute end of the season for the same. This is because they don't have information and the confidence that it would rain enough to store water needed to generate electricity. This compounded the disaster many times over. And this makes one clear that the Kerala flood is “human made”.

What has happened in Kerala is also happening across the world. It is an uncomfortable fact that we do not have a semblance of the plan to deal with this changing weather system. We are totally unprepared for what is today understood to be the extreme and variable nature of the monsoon.

It is a result of our combined and abject inability to miti-

gate global emissions, which is leading to such weird weather events. It is also the result of our mismanagement of resources. For example, Kerala has decimated its drainage systems, from forests to paddy fields to ponds and streams, that would carry excess water or store and recharge it. It is also the result of the sheer incompetence of our technical agencies to plan for flood control and dam management. It is, therefore, “human made”. It is “human made” because we refuse to accept that this is the new normal. We want to believe that this is just another freak event; another one in a 100-year event that we cannot plan for or do anything about.

This is where the reality must sink in—not just in words, but in practice. Kerala is going to be literally re-constructed. It cannot make the same mistake again. It must rebuild keeping in mind the new normal, where rainfall would be variable

and extreme. It must therefore, plan deliberately for drainage—every river, stream, pond and paddy field should be mapped and protected at all costs. Every home, institution, village and city must harvest rainwater so that rain can be channelised and recharged. The forest ecosystem must be managed through deliberate policies that benefit people. Plantation areas must be managed to conserve soil.

Above all, it must recognise that all these measures may not be enough in this age of climate change. So, the governments must plan for variability. This will require improving technical capacities to predict and inform. Kerala could have averted this deluge if prior to July it had better information of the rainfall expected in the coming months. The dams could then have released water intermittently and make space for storing excess water during the extreme rain events.

The question is what it will take in future for avoiding such a deluge. Our technical agencies—from weather scientists to water and flood management institutions—must answer this question. It is no longer business as usual. That time is over. Let's get this straight. ■



TARIQUE AZIZ / CSE

*Sunita Narain*

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## Waste warriors

Watch how four environmental engineers are helping Mumbaikers deal with municipal solid waste sustainably and affordably through a startup, Sanjeevani S3.

## Pushed to a corner

How is cow vigilantism affecting the rural economy? *Down To Earth* travels across Haryana, Uttar Pradesh and Rajasthan to find that traditional cattle rearers are abandoning their cows due to threats from vigilante groups.



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## In troubled waters



India's healthcare sector is battling with severe doctor shortage. Over the past nine years, dearth of professionals has claimed 72,000 infants in Madhya Pradesh.

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Summers are already hotter globally. And if carbon pollution continues to increase, urban daytime temperatures will rise by more than 5°F in most parts of the world.

### WEB SPECIAL

## Voicing worry

Experts have raised concern regarding FSSAI's coercive approach over making food fortification a mandatory business.

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## Hydro projects in focus

A study says that the Union government must consider changes occurring due to climate change while planning new hydropower projects.

### f FACEBOOK

## Eating right

Certain food items have non-nutrient components that hinder the absorption of vitamins and minerals, like tannins present in tea.

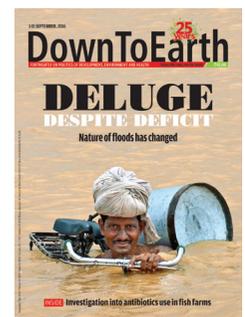
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### GLIMPSES FROM OUR ARCHIVE

## Kerala deluge

Total disregard for the environment has amplified the scale of destruction in Kerala. While rainfall has increased in the state in the past few years, infrastructure development has also compromised the

state's ability to deal with floods. In *Deluge Despite Deficit* (1-15 September, 2016), *Down to Earth* noted, "Even 40 years after India's first and last commission on floods was constituted, the situation has not improved. There is no national-level flood control authority."



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# Letters



## Myopic view

The Participatory Guarantee System (PGS)-India was promoted by the civil society since 2009 as PGS Organic Council (PGSOC). The latter consists of 21 non-profits across the country, to encourage organic farming among small- and medium-size, and tribal farming communities. Around 10,000 farmers are part of this body and get certification through trust and peer review by farming families. Using the same principle, the government introduced PGS-India as the low-cost alternative certification system to support small farming, but the online data entry makes it cumbersome. The move is well appreciated, however, the Food Safety and Standards Authority of India's mandatory notification, apropos "Organic glitch" (16-31 July, 2018), does not recognise the PGSOC system at all. Some of the PGSOC members are running social enterprises with fair trade principles and are remarkably supported by the consumer community. These consumers fear that private bodies will have a large control and that they may end up paying more.

**ROBERT LEO**  
VIA E-MAIL

*Down To Earth* welcomes letters, responses and other contributions from readers. Send to Sunita Narain, Editor, *Down To Earth*, 41, Tughlakabad Institutional Area, New Delhi - 110062

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## GM good or bad?

Apropos "Who is serving us GM food" (1-15 August, 2018). Genetically modified (GM) food is being consumed in the US since 1992, and 26 years is a long time to ascertain if there are any issues with it. As human life expectancy and population have dramatically increased, it is evident that GM food is not a threat to life or fertility. Any food that we consume today may not be genetically engineered, but is definitely GM, else we would have faced severe food

shortage. So, wake up and accept that genetically engineered food is not a monster as claimed by some activists. The choice of consuming non-GM products should be best left to the consumer by using something similar to the red and green dot labeling of the products.

**AYAN BANERJEE**  
VIA E-MAIL

✉ Great effort by the Centre for Science and Environment to generate awareness on GM food through research. No

wonder that Indian law enforcement agencies are not able to implement policies in almost all walks of life: the executors are bad. But, why does India need to import food if it produces enough? It needs to first address the inefficient supply system due to which a large number of people do not have access to food. The amount of food wasted is staggering—67 million tonnes every year—as per a government study. This is equivalent to the national output of countries like the UK



REUTERS

and enough to feed the whole of Bihar. It would not be out of place here to suggest a ban on the import of GM food products as they cause serious health hazards. Much research is required to improve the output and nutritional value of food produced indigenously.

**VINAYAK KIBE**  
VIA E-MAIL

### Genuine concerns

"The real weed" (16-31 July, 2018) is a good cover story. It tempts one to say, in an Einstein-like manner, that what

can match human greed is human stupidity. The story says illegal use of this carcinogenic and poisonous herbicide is due to illegal growing of GM crop cultivars, especially BG-III cotton.

I am for a total ban of GM cultivars of crops. A cultivar cannot be grown solely for being resistant to a particular pest or disease or weed. The need for higher yields and/or reduction in cost of cultivation lead to their replacement by new varieties, which are more often than not highly vulner-

able to biotic setbacks. Hence, the recent advocacy of using pest- or weed-resistant GM cultivars of crops needs a critical appraisal.

Experts' fears on risks of contamination of non-GM cultivars through escape of transgenes into natural ecosystems by pollen and seed dispersal are genuine. Despite no GM soyabean cultivar, there are already reports of traces of Bt in traditional soyabean cultivars in India. Terminator technology takes care of such danger through seed dispersal.

# Letters



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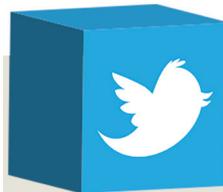
**Maharashtra's ambitious plastic ban continues to confuse** (posted on 21 July, 2018)

Let us not undermine the political will to ban plastic, though it might not be yielding the desired results. It takes time to normalise new changes.

**PARASHAR KUMAR**

Banning a material is not allowed in the Constitution. This is a lame effort by the government. If you are worried about plastic, throw your phone, TV, soap, brush, etc. Everything today is dependent on plastics. So, we will have to manage it. See the 2016 notification by the environment ministry; it is more rational.

**PRANAY KUMAR**



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**We all eat GM food, uninformed and illegally** (tweeted on 30 July, 2018)

Usually cotton seed is also a fodder for cows. Does this mean milk in India may also have GM ingredients in it?

**@Iyerwall**

**Editor's reply:** No tests done so difficult to say.

Which is better: GM food or pesticide food

**@doctor\_csr**

**Editor's reply:** Depends. Can't compare, but both have to be below safe limits.

However, pollen of GM cultivars have been found at distances several times greater than the prescribed barren zones. Risks are greater for crops with cross compatibility with their wild ancestors and for crops with greater genetic diversity. For example, species diversity is more pronounced for cotton in India than in China. Thus, the adverse ecological effects of Bt Cotton will be more severe in India.

None of the GM cultivars have been shown to outyield their non-GM ones. What mars GM technology the most is the farmers' inability to reproduce the seeds, retaining their originality, for sowing their next crop. They are, thus, at the mercy of seed companies and touts. If this cost of seed procurement is taken into consideration, the net income from cultivation of GM cultivars will be much less than those involving normal cultivars. There is no broad-spectrum weedicide, and overuse of weedicides for a long time is likely to lead to chemo-resistance in weeds. India's trade interest in export of agricultural produce remains in GM-free cropping. The nation would do well by sticking to genetic improvement of crop production by the conventional means.

**S VENKATARAMAN**  
VIA E-MAIL

## No civic sense

In "Sweeping verdict" (16-31 July, 2018), I agree with Chandra Bhushan that judging a city by merely its visible cleanliness is not fair to those that have better waste management practices. Our country is



ILLUSTRATION BY LUCILLE CLERIC

known for long for its recycled paper, plastics, metal and glass. However, there is no civic sense when it comes to littering. Yet plastic is being blamed for the massive pollution of land and water. It would be much easier if the waste is segregated at source. Waste management needs more emphasis so that urban waste is handled properly, causing minimum pollution. Only the waste that cannot be recycled should be dumped in scientifically managed landfills or burnt under controlled conditions. More efforts are required by every city and town to manage waste better. Only then will Swachh Bharat campaign have any meaning.

**D B N MURTHY**  
BENGALURU, KARNATAKA

## Elixir of life

This is regarding "Speaking Trees" (16-31 July, 2018). Sadly, a large number of people were killed, and several others injured across the country as rain and thunderstorms hit various states, throwing

life out of gear and leaving behind a trail of destruction. Trees are elixir of life—a must for good environment so that people live a healthy and hearty life. Simultaneously, there are laws to protect them but they need amendments so as to allow the removal of weak and dangerous trees. One way is to check their strength at regular intervals to see how much velocity-speed of air they can withstand and corrective action taken for weak ones to minimise any loss of life or property. Long-term measures are needed due to an increasingly unpredictable weather. Changes to the Indian Forest Act are essential too.

**MAHESH KAPASI**  
NEW DELHI

## Stitch in time

Mortality rates have been steadily rising due to stray dog bites, which in turn are also multiplying at a faster pace in every city and town. Hence, it is absolutely essential that civic authorities set up a separate cell to undertake special drives on a regular basis to round up stray dogs. They should sterilise these dogs and also administer them anti-rabies vaccines before setting them free. As a mark of identification, a metal strap can be tied around the dog's neck after sterilisation. The authorities should supplement the efforts of animal welfare organisations like the Blue Cross to contain the growth in canine population besides reducing any health hazard due to dog bites.

**K R SRINIVASAN**  
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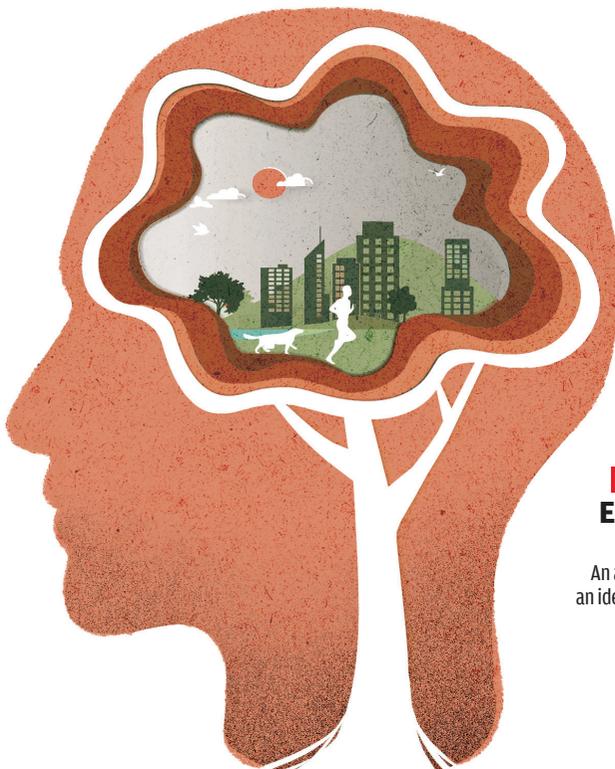


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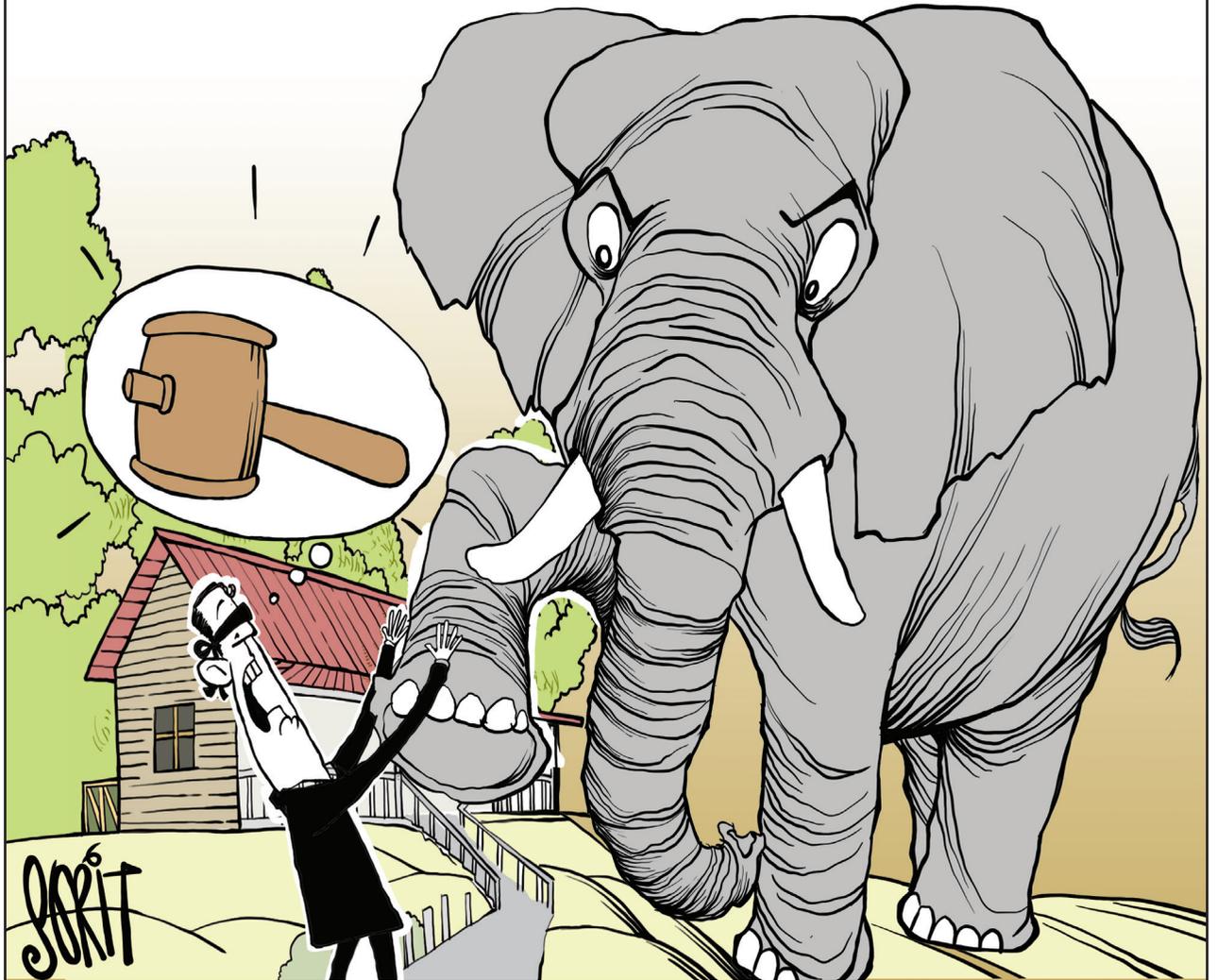
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BY SORIT GUPTO

## 'Close resorts in elephant corridors' - Supreme Court



## Elephant and a blind man

For more dose of wit, check out [www.downtoearth.org.in/cartoon](http://www.downtoearth.org.in/cartoon)

## Monsanto to pay \$289m in damages

**I**N A landmark ruling, agrochemical giant Monsanto will have to cough up a staggering US \$289 million in damages in the first trial over claims that its glyphosate-based weed-killer, Roundup, has caused cancer (see "The real weed", *Down To Earth*, 16-31 July, 2018.) San Francisco's Superior Court of California ruled that Monsanto had

failed to warn DeWayne Johnson, a 46-year-old groundskeeper who got non-Hodgkin lymphoma—a blood cancer—from Roundup, and other consumers of the associated risk. Last year, contradicting a WHO panel, the US Environmental Protection Agency said glyphosate is not likely to be carcinogenic. ■

## POINT

# 15 million

of the 26 million newborns in India are not breastfed in the first hour even as 80% of deliveries take place in healthcare facilities. This makes the children prone to diseases

Source: Arrested Development: the 5th Report of Assessment of India's Policy and Programmes on Breastfeeding and Infant and Young Child Feeding 2018

1,000 WORDS BY VIKAS CHOUDHARY



**BIRDS OF SAME FEATHER** This year again, fewer Greater flamingos visited the Sambhar Lake, India's largest inland salt lake located 75 km from Jaipur. Pollution due to illegal salt making units and overextraction of subsurface brine have significantly reduced the number of these birds visiting the lake over the past few decades. Abhishek Vaishnav, a local and bird-watcher, says there has been no breeding of the famous pink birds here since 1992 due to less water level and erratic rainfall. These birds favour estuaries and saline or alkaline lakes, and thrive on the extensive mudflats where they can feed and breed.

For more photos, check out @dtemagazine on Instagram

## FSSAI in denial mode

**DAYS AFTER** Centre for Science and Environment (CSE) warned that genetically modified (GM) food items are being sold in India flouting all food safety norms, the chief executive officer of Food Safety and Standards Authority of India (FSSAI) Pawan Agarwal said the government body cannot do anything about a report given by a "private organisation". A delegation of 10 civil society organisations, that protested outside FSSAI's office and also met Agarwal, quoted him as saying this. "We (then) requested him to test those samples in the government labs, but he (Agarwal) refused. He put the onus on us to produce evidence that GM food is not fit for human consumption. He ignored a large body of scientific work that suggests so," says Ajay Etikala, a member of the delegation. Reacting to CSE's findings, in which 32 per cent of the processed food samples, including cooking oil, had GM ingredients, the food safety regulator just said it was in the process of framing a law to regulate GM food. ■

## Earth on tipping point

**EARTH COULD** be just 10 to 20 years away from irretrievably tipping into a hellish "hothouse" state even if we meet the Paris Agreement goal of limiting temperature rise to 2 °C above the pre-industrial levels, top scientists have warned. A 2 °C warming could activate important tipping elements, which could trigger a domino-like cascade that could take the Earth to witness a higher global temperature than at any time in the past 1.2 million years. In a hothouse Earth, global average temperatures would rise by 4-5 °C while sea levels will witness an increase of 10-60 m above pre-industrial levels. "The impacts

of a hothouse Earth pathway on human societies would likely be massive, sometimes abrupt, and undoubtedly disruptive," the researchers write in the study published in the *Proceedings of the National Academy of Sciences*. They have identified 10 changes, the biggest being the loss of Arctic sea-ice, the melting of the permafrost zone, dieback in both boreal and the Amazon forests and weakening land and ocean carbon sinks. Another study by Oxford University found that climate change has more than doubled the likelihood of the European heatwave. It said an "unusually warm weather will become commonplace". ■

IN FOCUS

## Not a lonely planet



Scientists have **identified a set of planets outside our solar system** where life could have begun **just like it did on Earth**.

If a host star is **giving off enough ultraviolet (UV) light** to power a series of **crucial chemical reactions**, it could **kickstart the beginnings of life** itself.

The planets **lie within the habitable range** where liquid **water can exist** on the planet's surface, says the study conducted by researchers from the **University of Cambridge** and the **Medical Research Council Laboratory of Molecular Biology (MRC LMB)**.

The study published in *Science Advances* **brings together organic chemistry and exoplanet research** and builds on the work of British academic John Sutherland, an expert on the **chemical origin of life on Earth**.

Researchers believe that carbon in meteorites slamming into a planet's early atmosphere can react with nitrogen to form **hydrogen cyanide**, which rains down on the surface, collecting in pools of water. Hydrogen cyanide, when mixed with the likes of hydrogen sulfite, **can be baked by UV light** into sugars, polymers and phosphates—**the building blocks of RNA**. Like DNA, RNA can carry **evolutionary information**. DNA just carries twice as much.

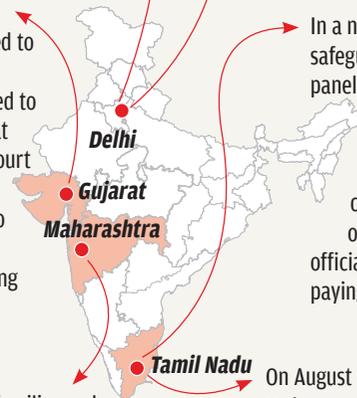
These planets could **offer an important place** to search for **alien life**. "This work allows us to narrow down the **best places to search for life**," says Paul Rimmer, lead author of the paper. "It brings us just a little bit closer to addressing the question of **whether we are alone in the universe**," he adds.

IN COURT

On July 31, the National Green Tribunal (NGT) observed that 50 per cent of the cases being filed at the green panel were "cases of blackmailers" and not related to the environment. "Earlier, we used to issue notices. But now we are not issuing notices and disposing of the cases," it said.

The Gujarat high court has cancelled all clearances related to the environment as well as coastal regulation zone granted to a company in Olpad near Surat over felling mangroves. The court has asked the authorities to conduct detailed inquiries into damages caused to the environment before considering fresh clearances.

Multiplexes are compelling families and children to eat junk food by not allowing outside food, said the Bombay high court on August 8. "If people can be permitted to carry home food inside an aircraft then why not to theatres?" the court asked the state government. It also sought an explanation how bringing food could pose a security threat.



NGT has asked the Director General of Civil Aviation to ensure that airlines stopped emptying poop or toilet tanks midair and warned that his salary will be stopped if it fails to do so. NGT said if there is "continued defiance" it may have to consider prosecuting the director general on September 17, the next date of the hearing.

In a new twist to the imposition of safeguard duty on imported solar panels and modules from July 30, the Madras high court permitted Shapoorji Pallonji Infrastructure to get its consignment of panels from overseas released by customs officials at Chennai port without paying the duty.

On August 9, NGT allowed mining firm Vedanta access to its administrative unit in the Sterlite Copper plant in Tuticorin, Tamil Nadu, but said the company cannot have access to its production unit. The Tamil Nadu government—which had ordered permanent closure of the plant following violent protests—has moved the Supreme Court challenging the order.

SO FAR...



Total cases on environment and development tracked since January 1, 2018 till August 9, 2018

SUPREME COURT  
**150**

HIGH COURTS  
**127**

NATIONAL GREEN TRIBUNAL  
**142**

## Bihar shelter home rapes: SC pulls up govt, bans victims' photos

**TAKING SUO** *motu* cognisance of the horrific rapes of more than 30 minor girls at a "shelter home" for destitute girls in Bihar's Muzaffarpur district, the Supreme Court on August 2 issued a notice to the state and the Central governments. Noting that the victims of sexual abuse anywhere cannot be compelled to "relive the trauma", the three-judge Bench also ordered the electronic, print and social media to ensure that their photographs should not be displayed either in morphed or blurred form for the safety, mental and physical health of the victims and in public interest". The court also noted that girls and women are being raped "left, right, and centre".



Compiled by DTE-CSE Data Centre. For detailed verdicts, visit [www.indiaenvironmentportal.org.in](http://www.indiaenvironmentportal.org.in)

# Carbon markets recover after slow growth

**AS GOVERNMENTS**, industries and individuals worldwide are seeking to curb their carbon footprint, the use of voluntary carbon markets is starting to accelerate after years of slow growth. A report by Ecosystem Marketplace, an initiative of non-profit Forest Trends, says in 2017 the supply of carbon credits hit an all-time-high of 62.7 million tonnes of carbon dioxide equivalent (MtCO<sub>2</sub>e).

The growing demand resulted in the purchase of 42.8-MtCO<sub>2</sub>e-worth of offsets in the first quarter of 2018—also a record. Since trading of carbon offsets first took off in the late 2000s, voluntary carbon projects have helped reduce, sequester 437.1 MtCO<sub>2</sub>e. This is more than Australia's energy-related emissions in 2016 or equivalent to not consuming 1 billion barrels of oil. ■

**EXTREME**

## 6 years

longer will people in Delhi live if air quality meets the national standards, says a study titled *A Roadmap Towards Cleaning India's Air* by the University of Chicago and Harvard Kennedy School

**660 million** Indians live in areas that exceed the country's standard for what is considered safe exposure to fine particulate pollution (PM 2.5)

**1 year** longer will Indians live if the country achieves its air quality standards. This would increase to four years if India meets the World Health Organization (WHO) norms

**13%** reduction in PM 2.5 concentrations was found during the first half of January 2016 due to the odd-even scheme

**\$500 billion** per year could be the cost of ambient air pollution for India

**Q & A**



### “Right regulation is key”

**WHO:** Vasant Dhar, Professor, Stern School of Business and the Center for Data Science at New York University, at a Brookings India lecture

**WHAT:** Artificial Intelligence has reached a point where machines are learning autonomously and making decisions. When do we trust them?

**WHY:** There has been a paradigm shift from people "programming" computers to perform something to creating machines that "learn" how to do it through data. This has all kinds of interesting implications, for how machines will improve our lives or how they will displace us. In supervised learning, data can be divided into <X Y> pairs where X is a situation and Y the response. The machine learns the implicit relationship in the X-Y pairs, which is then used to predict new cases where the Y is unknown. But machines make mistakes. What matters is the cost of mistakes. While driverless cars have a very high cost of error, for online marketing it is very low. Over time, machines will improve. But in cases like the driverless cars, the right regulation will be key in determining the costs of mistakes, and hence, the emergence of insurance markets.

# 151 Odisha villages linked to mainland after 46 yrs



**THANKS TO** the newly-inaugurated Gurupriya Bridge, as many as 30,000 people living in 151 villages in Odisha are once again connected to the mainland after nearly five decades of isolation. "It is not just a bridge, it will be the identity and *swabhiman* (self-respect) of Malkangiri (district)..." Chief Minister Naveen Patnaik tweeted

after inaugurating it. The villages were severed after the Machkund reservoir was constructed in 1960 on the Sileru river and Balimela Hydro Power Project came up in 1972. Though the 910-metre bridge was planned in the early 1980s, it took 36 years to turn it into a reality due to Maoist threats and technical challenges posed by the deep channel zone. ■

COVERAGE: MONSOON SESSION 2018

# New Ebola drug in Congo

**HEALTHCARE WORKERS** in the Democratic Republic of Congo are pinning hopes on an experimental Ebola drug to halt the latest outbreak in the restive east, near the Ugandan border. The outbreak "will get worse before it gets better", WHO's deputy director Peter Salama tweeted. The mAb114 treatment, which was 100 per cent effective when tested on monkeys, is being deployed against an active outbreak for the first time. It was developed in the US using antibodies of the survivor of an Ebola outbreak in the western Congolese city of Kikwit in 1995. Till August 14, the total number of cases stood at 57, including 30 confirmed and 27 that are considered probable. The country's health ministry said other experimental treatments have also arrived but await approval from an ethics committee. WHO says the current outbreak poses a high regional risk given its proximity to borders. ■

# Misplaced priorities

The government hailed the three-week monsoon session that ended on August 10 as one of the most successful ones since 2000, with productivity of the Lok Sabha at 118%. But were the discussions on the right track? An analysis of the time Parliament spent on discussions shows agriculture is at the bottom of the government agenda.



Minimum Support Prices for kharif crops and challenges in agricultural sector was an inconclusive discussion

**8 minutes**



Misuse of social media platforms to spread rumours and fake news leading to rising incidences of violence and lynching in the country

**1 hour 24 min**



Final draft of the National Register of Citizens in Assam, a discussion on which also triggered protests

**1 hour 34 min**



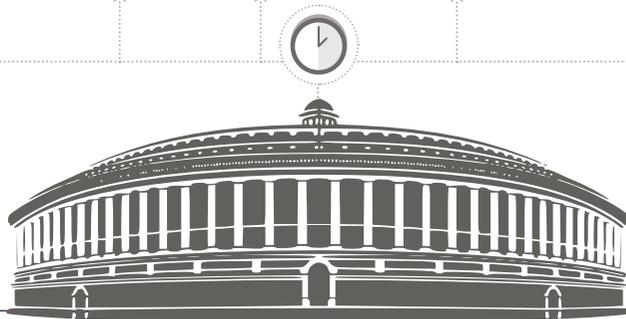
Recent flood and drought situation in various parts of the country

**5 hours**



No-Confidence Motion was moved against the government, the 27th such motion, but was eventually defeated

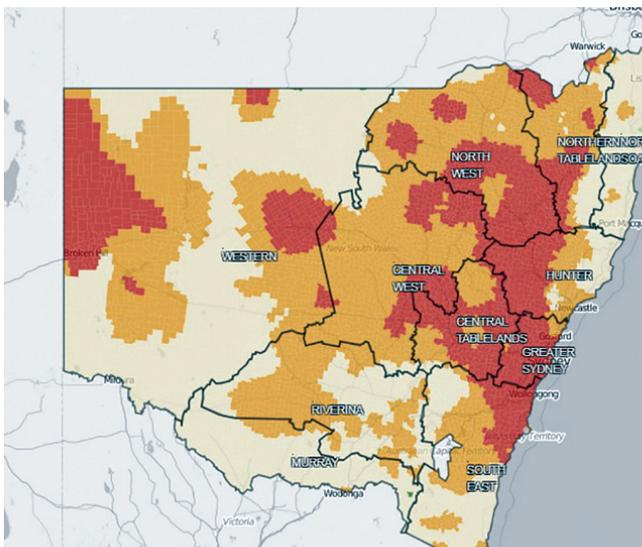
**11 hours 46 minutes**



SOURCE: PBS LEGISLATIVE RESEARCH



FREAK STREAK



## Drought grips Australia

- The entire New South Wales (NSW) is affected by drought, one of its worst on record
- Almost a quarter of the most populous state is classified as being in "intense drought"
- Less than 10 mm of rain has been recorded in July in the western, north-west and central areas of NSW
- The NSW government has increased drought assistance to over US \$1 billion

VERBATIM



**"Certainly, these trade issues are scary in that if you get people turning inwards, raising up tariffs, the global economy is not going to do as well. There are huge benefits to trade"**

— Microsoft founder Bill Gates on the current global trade tensions

By Saira Aslam



# Commons no more

Odisha government is setting up land banks to lure industries and investments. In the rush, it is alienating people from the commons. **ISHAN KUKRETI** travels to some of the areas worst hit by the government-sponsored land grab

**L**IFE HAS never been easy for the residents of Gurjanga village in Odisha's Dhenkanal district. The only motorable road to the village ends five kilometres from it. After that, a muddy trail along a thick forest of *kendu*, *mahua*

and *karanja* to access the village. So last year, when forest officials offered to build the road, residents of the 70-household village were overwhelmed. "In return, they wanted us to give up our village forest so that the department can set up a teak planta-

tion," recounts Arun Shamal. "It was a difficult decision because most of us depend on forest produce for a living. Our livestock also graze here," says Kirtan Pradhan, another resident. Last year, he earned ₹15,000 selling *mahua* flowers and *kendu* leaf plates.



Till a few months ago, this teak plantation of the Odisha forest department was a thick forest on which residents of Gurjanga Village, Dhenkanal, had traditionally depended for living

PHOTOGRAPHS: ISHAN KUKRETI / CSE

The officials, claim the residents, particularly persuaded Shamal and Pradhan whose 0.3 ha of private land was surrounded by the forest. “They felled the entire forest and trees on our plots soon after receiving our consent and have planted 6,000 teak and 400 *gambhiri* saplings,” says Shamal, adding they have not received any written document or compensation for forgoing their land.

When *Down To Earth* (DTE) visited the village in August, barb wires and pillars were lying along the road. Gurjanga residents said the department was fencing the plantation and converting it into a protected forest.

The promised road was nowhere in sight. When enquired, Rinki Kumari, divisional forest officer of Dhenkanal, told DTE the plantation has been set up under the Compensatory Afforestation Fund (CAF) Act, 2016. It has not been established by felling the village forest but is on a reserve forest, she said. While Kumari’s claim of afforesting a reserve forest defies all logic, the fact is Odisha government is alienating people from the commons in its drive to make the state one of the best investment destinations in the country.

Even though the state has slipped three places, from 11th to 14th, in the Union government’s “Ease of Doing Business” rankings this year, it has seen a significant rise in attracting manufacturing projects with over 118 large projects approved in last four years. A recent Invest India-World Bank survey on investment promotion preparedness ranks Odisha as an “aspiring leader” among 21 states.

Analysts say the government has achieved this by eliminating the biggest hurdle in setting up projects—land. For this, it has set up two land banks. In 2015, it created an industrial land bank under the Industrial Development Corporation of Odisha (IDCO) for making land immediately available to industries. The second one is being set up for establishing protected forests under the CAF Act, also to facilitate industries. Let’s elaborate this point.

Forests are routinely felled, or diverted as it is known in official language, for developmental or industrial requirements. In such cases, the Forest (Conservation) Act of 1980 requires that non-forest land, equal to the size of the “diverted” forest, is afforested. Since afforested land does not become a forest overnight the law requires that the Net Present Value of the diverted forest is calculated for a period of 50 years, and recovered

from the “user agency”, which can then be used for afforestation and creating protected forests. As 37 per cent of the state is under forests, any diversion of that land to create an industry is not possible without compensatory afforestation. In fact, in October last year, the state’s Chief Secretary AP Padhi admitted that projects have been stuck in the pipeline as areas are yet to be identified for compensatory afforestation.

However, DTE analysis shows that in its rush to attract investments the government is acquiring the commons ignoring people’s dependency on them and undermining community rights (*more on this later*).

### A bank to hit livelihood

Data with e-Green Watch, a portal maintained by the Union environment ministry for monitoring compensatory afforestation activities, shows since 2009, about 598 ha of revenue forest land in the state has been converted into protected forest for compensatory afforestation. Data available on the website of the Odisha forest department suggests 33 per cent of the communal land declared protected forest since 2010 fall under *patita* (fallow land) or *gramya* jungle (village forest) categories, while the remaining is *pahad* land (hillock). While people have traditionally depended on *gramya* jungle and *pahad* land for sustenance, fallow land is usually meant for future use when the population swells.

But once they are converted into protected forests, people’s access to forest resources would be limited. They would also be out of bounds for livestock. This would seriously affect the livelihood of those dependent on forests. According to the Socio-Economic and Caste Census of 2011, some 55 per cent of the population is landless in the state. “Forests not only help these households economically by



Rusi Majhi of Dukrigura village of Kalahandi shows title deeds granted under the Forest Rights Act. The government has earmarked his 0.46 ha for industrial land bank

providing minor forest produce, they also serve as grazing areas, which reduces the burden of buying feed," says Sricharan Behra of Campaign for Survival and Dignity, non-profit in Bhubaneswar. A 2012 study by the Foundation for Ecological Security based in Anand, Gujarat, shows the contribution of commons to household income was as high as 30 per cent for the landless, 25 per cent for marginal farmers and 23 per cent for small farmers. The contribution is highest in Odisha, shows the National Sample Survey Office (NSSO) data on commons released in 1998.

In Khheto village of Sundargarh district, the forest department has afforested a hill slope, where the residents had been traditionally growing crops. These people belong to a primitive tribe, Paudi Bhuyan, who practise multi-cropping by scattering seeds. "This year they have no land to grow food. Since their rights have not been settled, they are not able to oppose the plantation," says Kedar Mandal, a land rights activist in Bonai block.

Worse, at places, people are being alienated from private land and the ones settled under the Forest Rights Act (FRA), 2006 to fill the land banks.

### Another bank to evict people

Half-way across the state in Kalahandi's Lanjigarh block, IDCO has identified 40 ha in the tribal village of Dukrigura for industries. Residents were shell-shocked when DTE told them about the status of their land. "No one has come to survey the land or inform us about land bank," says Rusi Majhi.

An analysis of the data on IDCO's website shows all the earmarked land in Dukrigura fall under categories of *pahad*, *dungari* and *dangar*. These are hillside land and include 31 ha of revenue forest and the land on which people's rights have been settled under FRA. In 2007 Rusi and his neighbours Sunna and Dana received 0.46 ha, 0.4 ha and 0.73 ha under FRA. The trio have since been depending on the land for forest produce and grazing their livestock. These are now part of the land bank. In other words, the trio

will be barred from using the land as soon as a company is allowed to set up its shop there.

Interestingly, the village cremation ground has also been included in the land bank. In several other districts places of worship, also considered the property of *sarva sadharan* (the commons), have been earmarked for land bank. In Puri district, 3.2 ha of cremation ground in Aragar village and 5 ha *debasthali* in Goriputmatipara village are part of the land bank.

"The government cannot alienate people from the commons," says Hrusikesh Panda, former secretary with the Ministry of Tribal Affairs during whose tenure FRA was implemented. "Villages have historical rights over commons as they have been using those for centuries. In Punjab and Haryana, laws are in place for protecting such lands," he explains.

IDCO officials, however, claim that the village residents do not have rights over the commons. "The land belongs to the government and we don't need to pay anything to people," a highly



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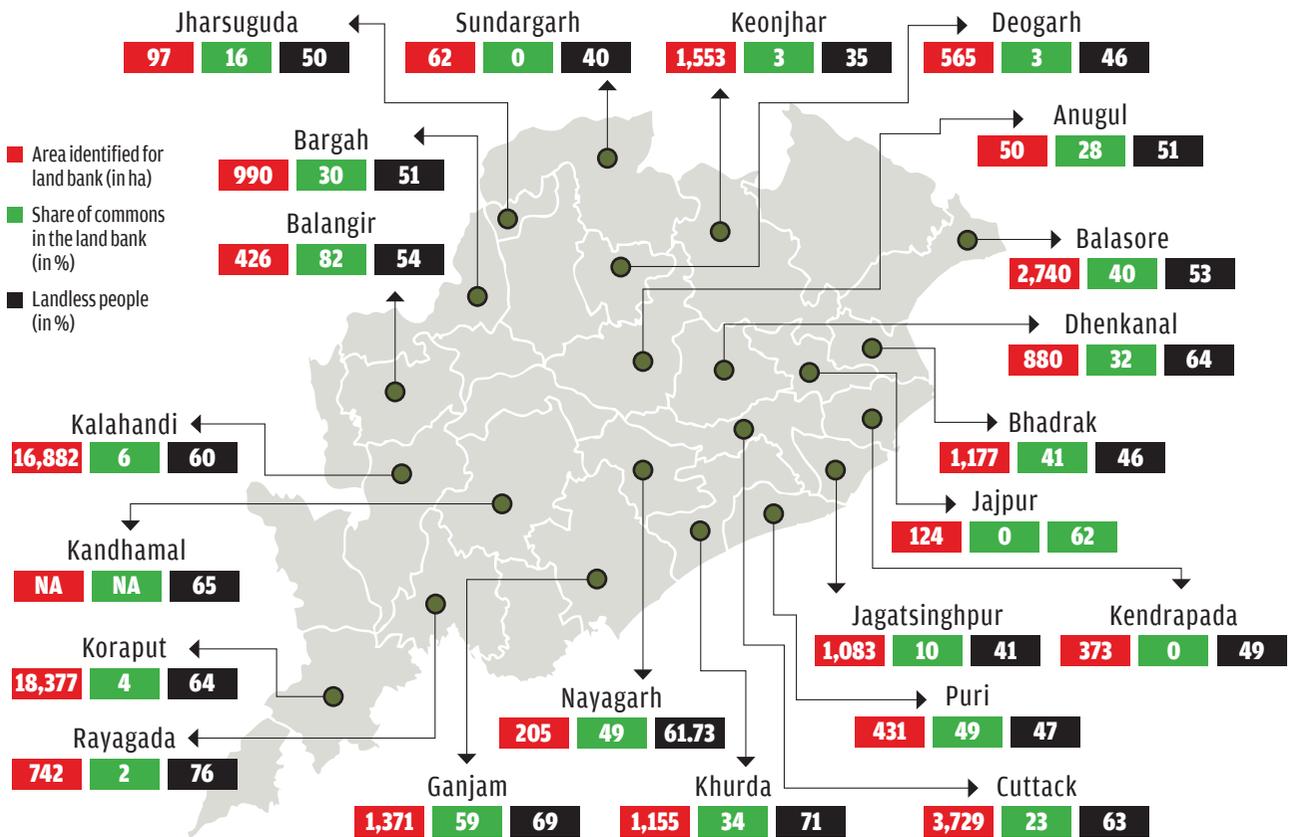
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# Who's land less?

Odisha government has identified 0.63 million ha for land banks, most of which is the commons. These are a major source of living for the state's 55% landless



Sources: Socio-Economic and Caste Census of 2011; www.idco.in

placed land acquisition official at IDCO told DTE on condition of anonymity. When asked about the rationale behind including land over which individual forest rights (IFR) have been settled and cremation grounds, he says it is due to administrative oversight but heaps the blame on the district administration. "They should have surveyed the land before its inclusion in the land bank." When contacted, district collector of Kalahandi PH Gavali said he is unaware of the issue as he is a recent recruit.

A former official with the Odisha Space Applications Centre (ORSAC), a state government body instrumental in identifying areas for the land bank using satellite technology, however, says the inadvertent inclusion of IFR lands in the bank has happened due to

sheer callousness. ORSAC officials have prepared the land bank digitally based on land records of the Odisha government. But it seems land records have not been updated to include all land use changes. The officials never visited villages to identify the land's nature of occupation. They just demarcated non-private land and put it in the bank, he says, requesting anonymity.

## But why the land banks

As uncertainty weighs heavy on Rusi's mind, he stares at the Niyamgiri hills, revered by tribal communities in the region. Located just a few kilometres from his village, the hills hit the headlines a few years ago when London-based Vedanta Resources wanted to mine Niyamgiri's rich seams of bauxite (aluminium ore) for its

Lanjigarh refinery. The hills reportedly contain 80 million tonnes of bauxite. But Vedanta faced a stiff resistance from the Dongria Kondh tribe, who traditionally inhabit the hills, and backed off after all the 12 gram sabhas voted against mining. Their decision also prompted the Union environment ministry to ban mining in Niyamgiri.

Similar protests against land acquisition prompted South Korean steel giant Pohang Steel Company (POSCO) to shift its US \$12 billion project, the single largest FDI in India to date, from Odisha's Jagatsinghpur district to Karnataka in 2017.

The IDCO official says the idea of setting up a land bank was conceived to avoid such incidences that make arranging land for industries "next

to impossible.” Small wonder, most lands in the industrial land bank are from bauxite bearing areas of Kalahandi and Koraput. To speed up the process, the revenue department through a notification dated January 20 this year, has entrusted district collectors with the power to take advance possession of the land. So far, the government has identified 0.2 million ha for the industrial land bank and 0.43 million ha for land bank under CAF, as per ORSAC.

### Faulting in desperation

Activists are worried because the government is demarcating land for the land banks by flouting laws and a Supreme Court order.

Some 44 per cent of Odisha is under Fifth Schedule Areas, which are governed under the Provisions of the Panchayats (Extension to Scheduled Areas) Act, 1996. Here, the consent of the *gram sabha* is required before taking up any activity. But this was not followed in any Fifth Schedule Area DTE visited. In Dukrigura, the sarpanch was clueless about land bank.

Historically, these were the places where most projects had been set up, says Panda. “These are large stretches of land and sparsely populated. The government thought the tribals will not resist. What we are seeing now is the extension of the same logic,” he says, adding that what the government is doing is against the Supreme Court order of 2011.

In the order, the apex court noted how commons have helped sustain populations across the country, and ordered states to clear encroachment on such land. However, Odisha is doing otherwise. The Odisha Government Land Settlement Act, 1962 grants the state the power “to reserve such portion of the lands as they deem proper for the purpose of being used as house-sites or for any communal or industrial purpose or for any other



Dukrigura village of Kalahandi district falls in the bauxite-rich region of Odisha. Most land in the industrial land bank belongs to this region

purpose whatsoever.” But experts say the government is reading the law from a narrow perspective. “It is alienating land for industries, while the law also talks about reserving land for home-sites and other communal purposes,” says Sricharan Behra of Campaign for Survival and Dignity. An assessment by non-profit Community Forest Rights-Learning and Advocacy shows that communities in the state have CFR rights over potentially 2.5 million ha. Titles have been settled for 6 per cent of the land.

Panda says the concept of land bank introduces a layer of non-transparency. “Lands are being acquired for ghost companies that will come up in the future. No one knows about their impact and whether they would generate employment.”

People have already started chal-

lenging land banks. In Dhenkanal, the residents of Balrampur village have approached the National Green Tribunal and the high court opposing the diversion of 64 ha of village forest first to the land bank and then to a bottling and brewing company. “In 2015, when we came to know that the land has been reserved for industry, we sent a letter of objection to both the tehsildar and the district collector,” says Sushant Dhala, a resident. “We never received any communication from them. And in 2016, the land was given to a bottling company,” he says. Saray Pradhan, who lives adjacent to the forest, says people from 12 villages are dependent on it. In 2016-17, 30 families earned ₹1.2 lakh by selling just *kendu* leaves.

“What will we do if the company destroys the forest?” he asks. ■

# Rise after the fall

Sikkim, once the world's largest producer of large cardamom, is trying to regain its lost glory. Can it achieve the feat in the face of a changing climate?

**NIDHI JAMWAL** | WEST SIKKIM

**A**T 92, Til Bahadur Chhetri is a living witness of the rise and fall of large cardamom in Sikkim. Prized for its complex aroma, the exotic spice *Amomum subulatum* is grown across the eastern Himalayan region, including Sikkim and the Darjeeling hills in India. "Till the late 1990s, I used to get 40 sacks (about 2,000 kg) of dry large cardamom a year from my 7.2-hectare (ha) land. After that production started to decline," says Bahadur, a resident of

Hee Patal village in West Sikkim district. "Though it has improved in recent years, all I get now is a measly 300 kg," he laments. In neighbouring Hee Martam village, Ganesh Chhetri, a young farmer, recounts a similar tale. "Just 10 years ago, my 2 ha land used to yield 300 kg of cardamom. It is now down to 100 kg," says Ganesh, adding that the decline has forced farmers to shift to less lucrative crops like corn, vegetables and fodder.

The trend is evident across the

PHOTOGRAPHS: NIDHI JAMWAL



Anitha Chhetri, a cardamom farmer in Sikkim's Hee Patal village. The exotic spice is a source of cash income to farmers in the mountainous state

Northeastern state, which till 2003-2004 was regarded as the world's largest producer of large cardamom. Though it continues to be the largest producer of large cardamom in India, the title of the world's leading producer now rests with neighbouring Himalayan country, Nepal, which caters to about 68 per cent of the global market share of the spice.

A 2014 working paper by the International Centre for Integrated Mountain Development (ICIMOD), an intergovernmental learning and knowledge sharing centre based in Nepal, shows that the area under large cardamom in Sikkim increased from 19,912 ha to 22,714 ha between 1999 and 2004. That year, the state saw a record production of 5,152 tonnes of cardamom, up from 3,710 tonnes five years ago (see 'Falling out of favour').

But since 2004-2005, the area under large cardamom has registered a decline, says Bharat Gudade, a scientist at the Gangtok-based regional research station of the Indian Cardamom Research Institute that functions under the Ministry of Commerce and Industry. Though production has shown signs of improvement following 2011-2012, only 17,735 ha was under cultivation in 2017-2018 producing over 4,385 tonnes of large cardamom. "We are working closely with agricultural extension agencies and farmers to reverse the declining trend," says Gudade, adding that the perennial crop is an important source of cash income to Sikkim farmers. ICIMOD study shows that the spice contributed US \$500-1,700 to a household's annual income in 2014.

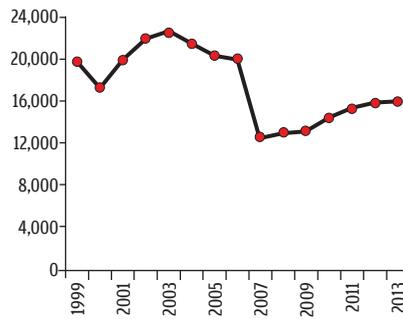
### But why the decline

Farmers and agriculture experts attribute the decline to several factors, including diseases and pests, old plantations, poor management, unavailability of good quality planting material and lack of irrigation facili-

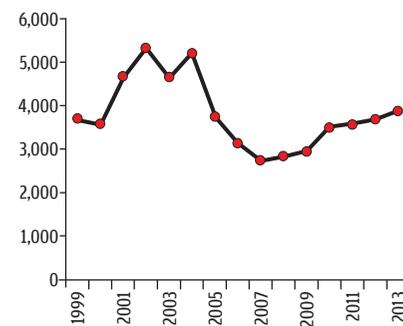
## Falling out of favour

After reaching the pinnacle of yield in 2003-04, large cardamom has slipped into a decline in Sikkim

### Declining acreage (in ha)



### Dwindling yields (in tonnes)



Source: Ghanashyam Sharma et al 2016, Declining Large-Cardamom Production Systems in the Sikkim Himalayas: Climate Change Impacts, Agroeconomic Potential, and Revival Strategies

ties. "Viral diseases, such as *chirke* (mosaic streak) and *foorkey* (bushy dwarf), are major threats to the crop. Once infected by *chirke*, the leaves turn yellow and the plant withers. In *foorkey* disease, the flowers do not grow into capsules," informs Bahadur, adding that the diseases were unheard of in the region some 15 years ago.

But several scientists say the state is losing the spice to climate change. Large cardamom thrives in cold-humid conditions under shades of trees, preferably the Himalayan alder (*Alnus nepalensis*), between 600 and 2,400 metres above the sea level.

Since the plantations require a high level of humidity (over 90 per cent) and soil moisture of more than 70 per cent, they are best suited to areas that receive annual rainfall of 2,000-4,000 mm and an ambient air temperature of 10-22°C.

Ghanashyam Sharma, co-author of the ICIMOD's 2014 working paper who heads non-profit The Mountain Institute India in Gangtok, says winter rains are important for the crop as that's the time the perennial plant produces new shoots. Rains are also required during March and April when the base of their stems becomes adorned with yellow flowers. "But, our winters have become extremely dry and warmer. A lack of irrigation system adds to the farmers' woes," he says, adding that long dry spells and disease infestations in recent years are largely responsible for the dwindling yields of the crop.

Two decades ago, several areas in the state, such as Namchi in South Sikkim district, had huge cardamom plantations at just 1,200 metres above the sea level, says Kailash S Gaira, scientist with the G B Pant National Institute of Himalayan Environmental and Sustainable Development, Gangtok. Due to the rise in temperatures in recent years and reduced winter precipitation, farmers are finding higher altitude lands to grow large cardamom, Gaira says.

These climatic changes have been well documented in the state government's 2012 report, "Climate Change in Sikkim: Patterns, Impacts and Initiatives". Over the last two decades (from 1991-2000 to 2001-2010), annual rainfall at the Tadong meteorological station has decreased at the rate of 17.77 mm a year; mean minimum temperature has increased by 1.95°C between 1981 and 2010, the report notes.

Farmers and scientists link the recent spurt in diseases, such as *chirke*

and *foorkey*, to this rising temperature and reduced rainfall. Gaira cites another reason for the declining production of large cardamom in Sikkim. Studies show that changes in local weather conditions affect the population of bumblebees, which is the primary pollinator of the exotic spice, he adds.

### Striving for lost glory

Ram Kumar Bhandari is a young farmer from Hee Bazar village, located about 10 km from Hee Patal in West Sikkim. While most farmers in the state are abandoning large cardamom, Bhandari says the yield from his plantations is on the rise. And, the credit for this rests with the traditional wisdom and scientific farming and irrigation practices he has adopted in his farm.

Bhandari grows the *seremna* variety of large cardamom which is native to West Sikkim. Santabir Subba, an octogenarian from neighbouring Hee Gaon, says the variety was, in fact, discovered in 1985-86 by a farmer from the region, Sukram Limboo. Today, the variety is grown across the north-eastern Himalayan region for its big-size capsules fetch a premium price in the market. Bhandari, whose family traditionally grew paddy and corn, started growing the variety on 2.8 ha of his farmland just a couple of years ago. "The variety grows well on virgin, fertile soil. Since our land had never been under cardamom before, we harvest an impressive 700 kg a year," Bhandari informs.

*Seremna's* short life cycle—unlike most perennial varieties, *seremna* yields only for four years—also allows Bhandari to follow healthy farming practices like crop rotation. After growing large cardamom for four years, he plans to uproot the entire plantation next year, and grow corn



**Winter rains are important for large cardamom as that's the time the plant produces new shoots. Rains are also required during March-April when the flowers start appearing**

and paddy for two years before returning to *seremna*. "I also grow legumes and fruits along with large cardamom. All these ensure that the land remains fertile and nature's balance is maintained," he says, adding that one of the reasons production of the spice has reduced in Sikkim is that most farmers have been growing it on the same land for several decades.

Ganesh says in his village Hee Martam almost 90 per cent of the farmers are growing *seremna* for two reasons. First, its not-so-thick capsules are easy to cure and fetch better price; and second, the variety allows crop rotation, which is now being seen as the only way to improve large cardamom yields in West Sikkim.

To deal with erratic rainfall, farmers have put in place decentralised systems of irrigation. "On an average, a large cardamom plant needs 64 litres of water during the months of

February, March and April to aid in panicles initiation and formation of fruits," says Bhandari.

He uses plastic pipes to bring water from a nearby *jhora* (perennial stream) to his plantation and has installed sprinklers across his farm to water the plants. In several villages, farmers have also dug pits to harvest rainwater. These pits recharge the aquifers and local springs, called *khola*, and help maintain soil moisture, which is important for the crop. If the rains give a miss to the region, farmers transfer the water to their farms using poly pipes and sprinklers.

Ganesh says farmers are also using mulches—dry leaves or grass and cow dung applied at the base of the plant—to maintain soil moisture and fertility.

To keep the plantations healthy and disease-free, Bahadur suggests following the traditional practice of burning the stubble. Now, due to lack of time and non-availability of farm labourers, most leave the stubble in the farms that could be responsible for the spread of the diseases, he says. Gudade says his institute is training farmers to select healthy non-diseased plants and not to overcrowd the farm. "Most farmers grow 10,000-15,000 plants in a hectare, which is an unhealthy practice. We recommend growing not more than 4,000 plants per hectare for a good yield," he says.

But can Sikkim regain its number one position? "Cardamom has given us good economic backing and has helped our children become engineers and doctors," says Subba. "We will not give up on it so easily." ■

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*The story is being published as part of Indian Himalayas Climate Adaptation Programme-Centre for Media Studies fellowship programme*



## TRAINING PROGRAMME ON

# SMART AND AFFORDABLE SYSTEMS FOR ENVIRONMENTAL QUALITY MONITORING

Globally, one of the functions of regulatory authorities on environmental management is to formulate plans for prevention, control and abatement of environmental pollution. To ensure better environmental management system implementation, it is imperative to have comprehensive database that indicates environmental quality. Collection of such database requires a good monitoring network comprising well established infrastructure, comprehensive protocol of monitoring and skilled manpower to oversee and ensure the reliability of data. Such monitoring network is cost prohibitive, time extensive and has limitations in terms of functions of the organization. Thus it is the need of the hour to streamline the process by the use of latest reliable technologies available like sensor based and portable instruments.

Anil Agarwal Environment Training Institute (AAETI) recognizes this need to fill in the gaps of the conventional method of monitoring, and offers a five-day extensive training programme on “SMART and Affordable systems for Environmental Quality Monitoring”, with the aim to build the capacity of the participants in the field of air and water quality monitoring, at a global level. The sessions will include field visit and demonstration as well as methodology for the development of protocols for calibration, certification and testing.

### COURSE HIGHLIGHTS

1. Policies pertaining to monitoring;
2. Concept of Smart monitoring;
3. Certification aspects of portable sensor based instruments;
4. Citizen monitoring;
5. Demonstrations;
6. Field visits for hands-on experience.



**Course Fees:** Rs 25,000/- per participant for Double Occupancy accommodation

Rs. 35,000/- per participant for Single Occupancy accommodation

(Fees Includes training material, boarding and lodging, travel from New Delhi to AAETI and back)

**Course Duration:** September 24th to 28th, 2018

**Course Venue:** Anil Agarwal Environmental Training Institute (AAETI), Nimli, Rajasthan.

**Who Can Apply:** Regulators, consultants, laboratory scientists and academicians.

### FOR FURTHER DETAILS, PLEASE CONTACT

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There are about 800 textile dyeing units on the banks of the Luni river in Rajasthan that discharge wastewater into the river

# Reluctant to upgrade

Zero liquid discharge technologies can help textile dyeing units recycle water and reduce effluents released into rivers. Why are they resisting?

**SUGANDHA ARORA SARDANA AND SANJEEV K KANCHAN** | NEW DELHI

**T**HE WATER in Rajasthan's Bandi river is strikingly blue in the stretch along the Pali district. But the blue is not natural and the water cannot be used. The colour is due to the presence of effluents discharged from over 500 textile dyeing units on its banks.

In May 2018, while hearing a 2012 public interest petition filed by Mahavir Singh Sukarlai of Pali non-profit Kisan Paryavaran Sangharsh Samiti, the National Green Tribunal (NGT) declared the water of the river

unfit for irrigation on the basis of an inspection report submitted by the tribunal's monitoring committee. The report said that the level of total dissolved solids in the groundwater in the area was 9,000 mg/l, when the levels in the surrounding areas were 400-1,600 mg/l, and blamed the textile dyeing units for polluting the groundwater as well as the river. The contamination is taking place despite a 2012 Rajasthan High Court order that bans discharge of treated or untreated water in the Bandi.

The problem is not limited to Rajasthan. "There are over 140 textile clusters in India. Of these, dyeing units are concentrated in Tamil Nadu, Rajasthan, Uttar Pradesh, Punjab, Gujarat and Maharashtra, and the problem of river water pollution is equally widespread," says M Madhusudan, additional director, Central Pollution Control Board.

In 2015, the Union Ministry of Environment, Forest and Climate Change (MOEF&CC) proposed a countrywide zero liquid discharge (ZLD)

regime for dyeing units that discharge more than 25 kilolitres of wastewater a day and all common effluent treatment plants (CETPS). Under this, all such units and CETPS had to recycle and reuse their wastewater instead of releasing it into rivers. But the draft was never implemented due to opposition from the industry which said that the technology was too expensive.

ZLD system uses technologies, such as three-stage reverse osmosis, evaporators and crystallisers that recycle salts and over 95 per cent of water for reuse. “The cost of ZLD wastewater treatment is more than ₹150/m<sup>3</sup> because the process of recovering salts is energy-intensive. In states like Punjab, Haryana and Uttar Pradesh, it is cheaper to just extract groundwater,” says Sajid Hussain, CEO of Chennai-based Tamil Nadu Water Investment Company. In Ludhiana district of Punjab, for instance, groundwater extraction costs just 20 paise/m<sup>3</sup>.

### Forced to act

Though there is no nationwide policy on the implementation of ZLD, the technology is being used in two districts of the country due to court intervention. The Madras High Court in 2006 and the Rajasthan High Court in 2012 banned discharge of treated or untreated effluents in the Noyyal and Luni rivers. As a result, the units in Tiruppur and Barmer districts were forced to adopt ZLD systems. “Residents, especially farmers, had filed numerous petitions over the years due to which the courts intervened in these districts,” says Hussain. But in both the districts the units and CETPS kept flouting the order till the courts threatened them with closure. In 2011, the Madras High Court ordered closure of 743 units and CETPS in Tiruppur unless they opted ZLD technologies. After the order, about 450 units set up ZLD system in their 20



Wastewater discharged from dyeing units contains heavy metals that contaminate rivers and groundwater

**In 2015, the Union environment ministry proposed a countrywide zero liquid discharge regime for textile dyeing units that discharge over 25 kilolitres of wastewater a day. But the draft was never implemented**

CETPS, while about 150 units adopted ZLD technologies in their individual treatment plants.

“The units in Tiruppur have strictly followed ZLD in the past seven years and no water is being discharged into the Noyyal river. Moreover, the demand for freshwater has reduced remarkably in the district while the water table has swelled,” says T R Vijaya Kumar, managing director of CBC Fashions (Asia) Pvt Ltd, a textile dyeing company based in Tiruppur. These results are also substantiated by 2030 Water Scarcity Group, a public-private-civil society collaboration, which says that the municipal water demand of the units has reduced by over 0.87 million cubic metres a year since they adopted ZLD.

“Similarly, in Barmer, the units have installed ZLD systems in all six CETPS. Since the drive to adopt ZLD started only about six years ago it is too soon to gauge the results,” says

Digvijay Singh Jasol, advocate at the Rajasthan High Court, who filed the petition against discharges in the Luni river.

NGT too is ensuring that the units follow the rules on discharge by conducting regular inspection. The last inspection was conducted in May.

### Cohesive plan is key

“A national level policy is required for large-scale implementation of ZLD,” says Madhusudan. “The primary reason the units are disinclined to opt ZLD is cost. But that can be offset by framing right policies” says Hussain.

“Currently, the difference in running ZLD units and non-ZLD units is just 15 per cent, which can be further reduced,” says S Nagarajan, president,

Dyers Association of Tiruppur. “Implementation of ZLD across the country would also level the playing field because currently ZLD adds about ₹4 per garment. If everyone had to use the technology, the cost difference would be negated,” Kumar explains. Moreover, when the court made ZLD compulsory in Tiruppur, many units shifted to the neighbouring state of Karnataka, where there was no such order. This would not have happened had ZLD been compulsory across the country.

“Currently, there is a lack of monitoring by regulatory authorities, the price of water for industries is quite low in many states and industries are free to exploit groundwater. This needs to change,” says Hussain. “The government should also encourage adoption of cleaner technologies by providing financial assistance and subsidies,” he adds. ■

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# Save the cow ~~mother~~

Oxytocin is given to women during and after childbirth to save their lives from blood loss. But the government is planning to restrict its use as it is illegally given to cattle to increase milk production

**VIBHA VARSHNEY** | NEW DELHI

**O**XYTOCIN IS a hormone that women produce naturally during and after childbirth and is said to strengthen the bond between mother and child. But many women have to be given the hormone after vaginal childbirth to treat blood haemorrhage. Gynecologists often prescribe the hormone to strengthen contractions during childbirth and control bleeding after childbirth. In fact, the drug is part of India's National List of Essential Medicines.

Strangely, the Union Ministry of Health and Family Welfare has decided to restrict the use of this drug. After September 1, 2018, only one public sector manufacturer, the Karnataka Antibiotics & Pharmaceuticals Limited (KAPL), would have the licence to produce this hormone and it can only sell this through registered hospitals under the Pradhan Mantri Bhartiya Janaushadhi Pariyojana (PMBJP) and the

Affordable Medicines and Reliable Implants for Treatment (AMRIT).

## Reason for restriction

In October 2014, the Union Minister of Women and Child Development Maneka Gandhi wrote to the health ministry to flag the issue of "loss of livestock in the country" due to the illegal use of oxytocin. It is no secret that the dairy industry uses the drug to increase milk production in cattle. On March 15, 2016, the Himachal Pradesh High Court asked if restricting the manufacture of oxytocin only in public sector companies was feasible. The Drugs Technical Advisory Board, a statutory body constituted under the Drugs and Cosmetics Act, 1940, recommended that formulations for human use can be restricted to be supplied only to registered hospitals in the public and the private sector



to prevent its misuse. At present, oxytocin used by the livestock industry is produced in unlicensed facilities.

But health activists label the move as an effort towards *gauraksha*, disregarding woman's health. The president of the Federation of Obstetric and Gynaecological Societies of India (FOGSI), Jaideep Malhotra, says that the maternal mortality ratio (MMR) is likely to increase due to this illogical decision. She points out this will create a problem for small clinics that do just five to 10 deliveries a month as they would now have to set up cold storages to preserve them. "About 70 per cent of deliveries are done in private clinics, but they have not been kept in mind while taking the decision. What is the backup plan if a natural disaster hits KAPL and production has to be stopped?" she asks.

Activists point out other issues with KAPL. For one, it does not have any experience in making and supplying the drug as they began production for the first time only on July 2 this year. It is estimated that around 60 million ampoules of oxytocin would be needed every year. The price of the drug being quoted by KAPL is higher than what states are paying now and thus will put states under financial burden. KAPL doesn't even have expertise in cold chain which is essential to prevent degeneration of oxytocin. "Our experience with paediatric AIDS medicines show that the government's cold chain is plagued with supply chain issues," says Leena Menghany of Médecins Sans Frontières (MSF), a non-profit. FOGSI has sent its concerns to the health ministry.

Activists too have filed a public interest petition through the All India Drug Action Network (AIDAN) in the Delhi High Court, asking for the order to be quashed. On August 16, 2018, the court asked the government to respond before August 24.

As of now, there is no research to prove that misuse of oxytocin by the dairy industry is impacting human health. A study by the National Institute of Nutrition, Hyderabad, and another by the National Dairy Research Institute, Karnal, says that the presence of oxytocin in milk for human consumption was undetectable due to degradation in the intestine. At the same time, there are anecdotal reports about the ill-effects of oxytocin on cattle. It is said that oxytocin leads to infertility in cattle. It has also been linked to mastitis, a painful inflammation of the udder. Health activists say that concerns about animal health should be dealt without affecting the availability, accessibility and affordability of oxytocin for women. The dairy industry is misusing the drug, not the doctors, says Malhotra

WHO, which has been quiet on the issue so far, recently pointed out that the benchmark for cervical dilation rate at 1 cm/hr during the active first stage of labour is unrealistic for some women and should not be used as an indicator for the use of oxytocin to hasten labour. This would reduce excess and irrational use of oxytocin. To take care of haemorrhage cases, WHO along with Ferring Pharmaceuticals and MSD for Mothers have tested a new drug carbetocin and have found it to be as effective as oxytocin in controlling haemorrhage. An additional advantage is that the drug is heat stable, unlike oxytocin. Researchers say the drug would help reduce MMR due to haemorrhage in regions that don't have cold storage facilities. This is where 99 per cent of maternal deaths due to haemorrhage currently occur. However, it will take time before carbetocin reaches the markets, as Ferring is seeking registrations for its manufacture. Other than oxytocin, the choices for women include Methergine which too requires cold storage and Misoprostol, an oral drug which has side-effects.

It is difficult to understand what the government's plan is. On August 10, it released a draft notification that shifted oxytocin from Schedule H to Schedule H1 of the Drugs and Cosmetics Rules, 1945. This would mean more documentation would be needed at the retailer level suggesting the government could be considering sales through retail chemists. It must be noted that the government has not taken similar action in case of antibiotics which are being misused by the poultry industry. "The decision seems hasty for many reasons," says Malini Aisola of AIDAN.   @down2earthindia

# Live life farm style

Want to live in a city and grow your own food in a village nearby? There are companies that can help

**MEENAKSHISUSHMA** |  
HARYANA

**I**F YOU are a city dweller who wants to practise farming on weekends for fun, or a health conscious individual who wants to be sure that the vegetable on the table has been grown without the use of pesticides, this is just the initiative for you. Three companies in Haryana are offering land where you can grow what you want for a nominal price.

The companies—Edible Routes, Green Leaf India and Organic Maati—take land on lease from farmers in and around Gurugram and Palwal districts and sublet it. Neha Goyal, a lawyer based in Delhi, says she leased 0.2 hectares (ha) from Edible Roots in July because she wanted to be close to nature and learn about agriculture. “I plan to grow tomatoes,” she says.

Edible Routes is owned by Kapil Mandawewala, who launched the company in 2010 in Delhi to help people practise organic farming. In June 2018, Mandawewala leased a little over 4 ha from a landowner in Gurugram’s Garhi Harsaru village and started subletting plots to subscribers. As per the contract offered by Edible Routes, a subscriber has to lease at least 0.2 ha for six months. The cost for this comes to ₹29,992 (see ‘Control what you eat’). The company promotes its initiative through the social media and workshops it holds for its other activities, and in just two months, Edible Roots has had over 42 subscribers for its “farmlet” initiative. “I studied financial management in the US, worked there for five years and returned to Gujarat

ARNAB PRATIM DUTTA / CSE



Meeta Talwar (in background), a Delhi-based architect, has leased 0.2 ha from Edible Routes in a village in Gurugram and says that her entire family enjoys the process of growing food

## Control what you eat

The cost of owning and running a small farm for six months is as low as ₹30,000

in 2008 to practise organic farming on my farmland. I tried farmlets there too, but the idea did not gain attention. In Gurugram, it has caught on," says Mandawewala.

Edible Routes has hired two farmers at ₹10,000 a month. They live in an accommodation on the plot with their families and are responsible for the farm's security and maintenance. Mandawewala holds an orientation programme at the plot every week to inform subscribers about the seasonal vegetables that can be grown.

The subscribers are also given information about the preparation of the field and sowing, and are encouraged to visit at least once a week to take part in the cultivation process. "They can visit whenever they want," says Mandawewala. "The subscription cost includes the money that the company spends on buying seeds, fertilisers and providing irrigation. I expect a profit of ₹50,000 per acre (1 acre equals 0.4 ha), though it is too early to talk about profits," he says.

### Profit not a motive

Unlike Edible Routes, Green Leaf India does not have a profit motive. Launched in 2016 by Deen Mohammad Khan, district horticulture officer of Gurugram, the company has leased about 3 ha in Geratpur village of Gurugram from six farmers and has sublet it to 80 subscribers. Each subscriber owns 0.004 ha for six months for ₹31,974. "I came to know about the land in the village through some farmers and convinced them about the benefits of the business model," says Khan.



**EDIBLE ROUTES**

**Farm location**  
Garhi Harsaru  
village in  
Gurugram

**Minimum land  
one can lease**  
0.02 ha

**Lease period**  
6 months

**Cost**  
₹29,992

**Subscriber's  
share in harvest**  
100%



**GREEN LEAF INDIA**

**Farm location**  
Geratpur  
village in  
Gurugram

**Minimum land  
one can lease**  
0.04 ha

**Lease period**  
6 months

**Cost**  
₹31,974

**Subscriber's  
share in harvest**  
100%



**ORGANIC MAATI**

**Farm location**  
Kishorepur and  
Kiranj villages in  
Palwal

**Minimum land  
one can lease**  
0.4 ha

**Lease period**  
1 year

**Cost**  
₹60,000

**Subscriber's  
share in harvest**  
50%

Green Leaf India's business model is the same as that of Edible Routes, except for one difference. "Here the farmers who own the land are also employed to help the subscribers. For this I pay them ₹2,000 a month. So they earn from the lease as well as get a monthly salary. On an average, the six farmers make ₹60,000 a year from their lands," explains Khan.

### Putting land to use

The business model of Organic Maati, the third company, is slightly different. The subscribers only get to keep 50 per cent of the produce, while 50 per cent goes to the company. But since it offers 10 times more land than Green Leaf India or Edible Routes, at the same cost, the output is more and subscribers happily part with the produce. Deepak Gupta, who launched the company in 2012 to deliver organically grown vegetables to homes, and

diversified to "farmlets" only in 2016, says that he sells the produce to cafes and retail shops to provide a monthly salary of ₹15,000 to the five farmers who look after the land. He also provides them lodging facility near the plot. "The farmers from whom I leased land were about to quit farming," says Gupta, who leased over 16 ha in Kishorepur and Kiranj villages of Palwal in 2016. He claims that the company made a profit of ₹50,000 in 2017-18 from this initiative. Rishabh Gupta, a Gurugram-based chartered accountant, who has sublet 0.4 ha from Organic Maati in May, says the idea of "farmlet" is sustainable. "The model provides financial security to farmers irrespective of drought, flood or any other disaster. Moreover, as the farming is organic, whatever we take from the earth, we return it in the form of compost and natural fertilisers." ■ [@meenakshisushma](https://twitter.com/meenakshisushma)

# DELUGE OF THE CENTURY

Kerala's worst flood since 1924 reinforces how local environmental degradation and lack of disaster preparedness can make extreme weather events deadly

SHREESHAN VENKATESH WITH  
REJIMON KUTTAPPAN IN KERALA





August 19, 2018  
People wait for aid next to a  
makeshift raft at a flooded  
area in Kerala

**W** E CAN'T understand which one is river and which one is road." That is how Rajesh S, a resident of Chengannur town in Kerala, described the ground zero situation to *Down To Earth* (DTE) speaking over a mobile phone. River Pamba swelled bringing Chengannur under water. "But we all expected this would happen," he says. The day the state government decided to open all the dams, Rajesh told DTE, the devastating flood was just a matter of time. As the outside world tracked news of heavy rains for more than a week after August 8, the response was just a habitual disclaimer. For a state living with two monsoons and fighting drought for the last three years with a monsoon deficit ranging up to 34 per cent, it was a respite. Day after day, over 11 days, floods gripped all the state's 14 districts with an unheard of ferocity. Amateur mobile videos of the

destruction started streaming out: hills crumbling down as debris, people being swept away by gushing streams, dams brimming with water and most of the towns and villages filled with displaced people. This was Kerala's worst flood in almost 100 years.

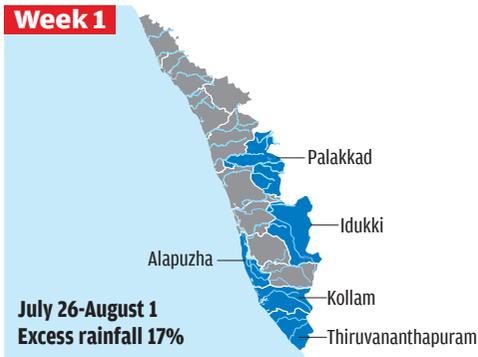
On August 19, for the first time in the preceding 11 days, satellite images of Kerala captured fractures in the cloud cover. The state government lifted the red alert consequently. The fragmented clouds over the state unearthed the real devastation. Everybody had one question: was it normal?

"It is abnormal but not unusual," says DS Pai, the head of climate services division of the India Meteorological Department (IMD). Official response is always presented using the tact of terminology. Over 11 straight days of tempestuous rainfall, nearly 25 trillion litres of water fell on Kerala—an area of

August 19, 2018  
Volunteers work at an  
aid distribution centre  
inside a stadium in Kochi

REUTERS





**"It is now found that the increase in heavy rains is relatively more during the break phases than the active phases. This means that there is a flattening of the monsoon intraseasonal oscillation in the recent years so there are few well-defined breaks"**

**ROXY MATHEW KOLL, scientist, IITM**

38,800 square kilometres cramped with mountain ranges; third-highest population density in the country; and, 44 rivers with 61 dams—with apocalyptic fury.

### **A ravaged landscape**

The state doesn't have the experience of coping with this scale of damage to life and property—it claims that only 14.52 per cent of its area is flood prone. At the time of writing, the government confirmed 387 deaths. The state government has estimated the preliminary loss at ₹20,000 crore, which is around 15 per cent of the state's GDP estimate for 2018-19. According to risk management agency, Care Ratings, floods have affected more than four million people, a significant percentage of them labourers. In August alone, people would lose wages worth ₹4,000 crore. More than one million people are in relief camps that would take around ₹300 crore a month to maintain. More than 12,000 kilometres of roads have been damaged hindering speedy relief and rebuilding operation. In totality, the state's growth rate would be down by one per cent.

The current flood came after a strange phase of the monsoon that defied normal rainfall pattern. On an average, Kerala receives close to 3,000 mm of rains annually. Of this, the monsoon is responsible for slightly over 2,000 mm. But this year it surpassed this despite the fact that around a third of the monsoon season is yet to come—by August 19 the state had received close to 2,350 mm of rains. According to IMD, Kerala received 2,346.6

mm of rainfall against a normal of 1,649.5 mm since the beginning of June—an excess of 42 per cent.

Typically, Kerala receives strong monsoon showers in June and July as the southwest monsoon gains strength, after which there is a lull in the latter two months of the monsoon. While the first two months saw slightly above normal rains this year, the normalcy did not extend into August. Within the first three weeks of the month, the state received close to 500 mm of rain over and above the normal rainfall of about 290 mm. Of the 760 mm rainfall received by the state since the beginning of the month, close to 75 per cent was received in the eight days between August 9 and 17, representing a departure from normal by around 300 per cent for the time period.

The distribution of the Indian monsoon is directed by the location of the monsoon trough—a belt of low pressure caused by solar heating. The axis of this trough oscillates between the Himalayan foothills and central India. In its normal position, the trough extends from northwest India to the east coast, close to Odisha and West Bengal. At this position, central India and the west coast get good rains. When the trough moves north the monsoon is said to be in "break" phase and most of the subcontinent barring the Himalayan states receive little or no rain. The "active" phase of the monsoon is when the trough moves south of its normal position causing heavy and intense showers in the southern peninsula. Between August 8 and August 16, Kerala received two spells of

widespread intense rains. The first spell of heavy rains prior to August 10 was heralded by just such a system and was anticipated by monsoon trackers.

### Atypical cycle

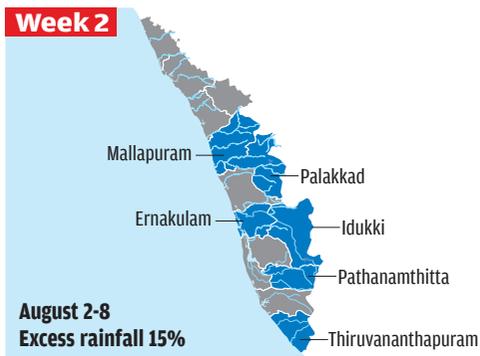
What came as a surprise though was the second spell of rainfall after August 14. The western end of the trough at the time was not stable and oscillated north-south of its normal position. The position of the monsoon trough helped the formation of an offshore trough that is responsible for most monsoon rains in the west coast. However, the instability of the monsoon trough resulted in only a feeble offshore trough. This atypical second spell of rains from August 13 onwards overwhelmed the state by pounding the region with the highest concentration of reservoirs in the state.

Between August 8 and August 15, each of the 14 districts of the state recorded much more than normal rainfall. The worst hit were the districts of Idukki (679 mm), Wayanad (536.8 mm), Mallapuram (447.7mm), Kozhikode (375.4 mm) and Palakkad (350 mm), each of which received rains that were several times more than the normal. The situation further worsened in Palakkad and Kozhikode as heavy rains were recorded until August 18.

“This year the association of monsoon rains with trough position is not as strong as it is in most years. For one, the active-break cycle is not as stark as it is usually and we are seeing more and more extreme events even

during the supposed break phase. While this is not unheard of, it is not the typical condition during monsoons,” says Pai. “The feeble offshore trough, off the western coast, is the reason for the high cumulative quantity of rain received by Kerala. While the offshore trough stretching from northern Kerala towards the rest of the west coast is not unusual, the recent rains in Kerala indicate that the offshore trough did not move. The strong monsoon winds converged over a single region and that is why the cumulative rainfall in Kerala has been so high,” says Akshay Deoras, an independent forecaster.

While the offshore trough is the reason for the rainfall, it is not the only determining factor in the distribution of rains. How monsoon winds move and bring rainfall is also heavily dependent on the formation of low pressure systems and depressions over the Bay of Bengal (BoB) and their movement over the mainland. Typically, low pressure systems develop over northern BoB, near the West Bengal coast, and move west-northwestwards. However, during the spate of rainfall in Kerala in mid-August, the low pressure system associated with the heavy rainfall formed closer to the Odisha coast. Subsequently, it moved west-southwestwards towards Maharashtra rather than the normal route that results in rains in central India and the Indo-Gangetic plains. “Generally the depressions associated with such floods occur over the north of BoB. But this time, it occurred over the south of



**"The rainfall over Kerala is not unusual but rather abnormal. Since June, we have received good rains all over the west coast including Kerala. Dams were full by the end of July but dam water wasn't released at the time, which caused an urgent release in August"**

**D S PAI, senior scientist, IMD**



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BoB. Initial analysis shows that this might have anchored the monsoon westerlies over Kerala. Normally with the depression over the north BoB, the westerlies would have been towards the north of Western Ghats, with places like Mumbai receiving heavy rains,” says Roxy Mathew Koll, a scientist with the Indian Institute of Tropical Meteorology, Pune.

The numbers of low pressure systems that have developed into depressions that influence the distribution of monsoon rains are below average this season. The climatologically average indicates the development of six well-marked depressions during the four monsoon months—one each in June and September and two in the months of July and August.

However this year, the first depression was formed only in the end of July. With only a little more than a month left, only three depressions have formed so far in BoB and moved into the Indian mainland. The reduced number of depressions has suppressed distribution of rainfall in the subcontinent and has contributed to the concentration of rainfall over four prolonged spells primarily in the west coast since the onset of the monsoon.

Meanwhile, rainfall in the rest of the country so far does not inspire confidence with only a fourth of the conventional monsoon remaining. Despite floods in nine states, 41 per cent of India’s districts are still facing a rainfall deficit (see ‘Excess rains plague India’, p41).

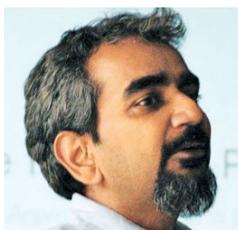
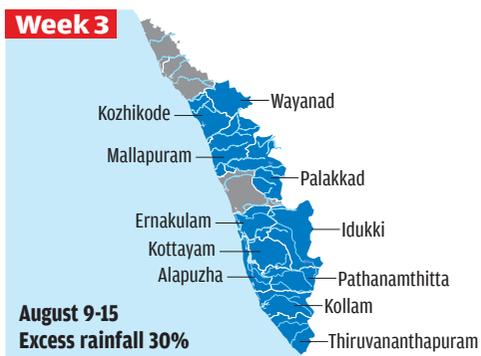


August 17, 2018  
A sick man waits to be airlifted by the Indian Navy from a flooded area

### The trigger

What made this “abnormal” climatic episode deadly were the state’s faulty disaster responses—both short- and long-term. Shockingly, the Central Water Commission (cwc), India’s only flood forecasting agency, doesn’t have any flood forecasting system in Kerala. This deprives the people of the state any reliable way for flood preparedness.

Kerala is ecologically sensitive owing to the geography and topography of the region. Practically, the entire state is drainage medium for run-off from the Western Ghats



**"Holding or releasing water from dams, and understanding what level of flooding it may cause, is complex. Holistic water management that includes appropriate release of water from dams, impact forecasts and warning dissemination could save lives"**

ANSHU SHARMA, disaster risk reduction expert



REUTERS

towards the Arabian Sea. As a result, the state has a dense network of rivers linking the hills to the sea. While rain is abundant across the state, statistics over recent monsoons reveal that it is, in fact, the coastal regions, especially in northern Kerala, rather than the Western Ghats that receive the bulk of the rainfall during the monsoons. Because of this, Kerala's rivers are spared the flooding risks associated with rivers swollen with heavy volumes of run-off. This year though has been extremely wet for the ghats of Kerala and this is precisely what submerged the state. Between August 1 and August 15, Idukki—which is nestled deep in the Western Ghats and holds 17 reservoirs (the most for any district in the state)—received more than 800 mm of rain. Similarly, in Palakkad which has the second highest concentration of reservoirs, the amount of rainfall recorded between August 1 and August 18 was close to 700 mm. In both these places, the rainfall recorded exceeded 200 per cent above normal for the region and floodgates of at least 29 dams in the districts had to be opened adding to the flood fury and landslides in downstream areas. "The infrastructure definitely added to the magnitude of the

## Samaritans all

Even before government agencies could reach flood victims, survivors started conducting relief operations in Kerala

**THE FLOODS** in Kerala are not just a story of poor planning or nature's fury, it is also about Kerala's unique resilience that shone through during trying time. The defining aspects of the rescue and relief operations were undoubtedly the calm coordination between the multitude of civil actors from government officials to fisherfolk, white collar professionals to school children, all of whom turned up when they were needed the most. Schools, churches, temples, universities, commercial complexes were all converted to temporary relief camps in almost no time.

Much before the Navy and the Coast Guard came to rescue people from Kerala's sinking villages and towns, the locals, sensing the ferociousness of the floodwaters, banded together to save their own. People went from house-to-house, knocking on doors in the dead of night to tell strangers, friends and family that it was not safe to stay at home.

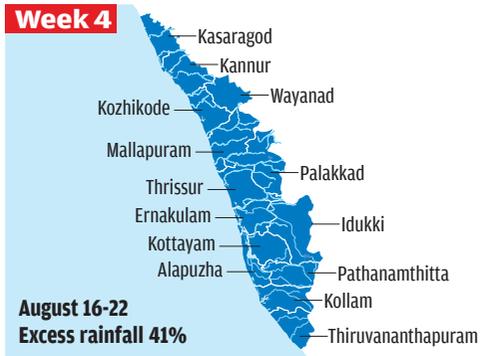
Those in low-lying areas were swift in assessing the danger, grabbing clothes and a few essential items and running out of their homes. Others, who had the luxury of upper floors, sat nervously for hours before listening to their villagers' appeals. They had the more ominous stories to tell, escaping in a wobbling fishing boat or canoe as it danced left and right in the intense currents of the river. Together, the villagers who probably didn't even know each other's names, showed extraordinary courage in the face of adversity.

The first reaction within the state was a collation of information on people who were missing or stranded that was circulated swiftly through social media networks. Along with names, location-based requirements of essential items were quickly distributed on multiple platforms with social media proving to be the cornerstone of probably the world's largest such citizen-led rescue and relief operation.

High education levels and comfort with technology helped in such efforts mushrooming all over the state. Before long, the state government began centralising all efforts through a single website. Vitally, the website enabled effective coordination and communication between the public, rescue volunteers and government authorities at different levels.

While Kerala's netizens ensured that social media's exponential reach was put to good use, coastal fisherfolk of the state emerged as the heroes on the ground. Venturing inlands with their boats, the fisherfolk were an invaluable link in Kerala's rescue efforts as they could reach hopelessly cut off places to locate and save tens of thousands of people across the state. The state offered fisherfolk involved in rescue efforts ₹3,000 for each day of their help only to be refused by them.

Meanwhile, volunteers poured in from all over the state and the country to help out with distribution of aid, provide medical assistance and help in rescue efforts. Yet by all accounts, relief camps were an epitome of composed coordination. Devastating floods can seldom be recalled among the finest hours of a society, yet this is exactly what the Kerala floods were described as by none other than UN Environment's Disaster Risk Reduction Chief Muralee Thummarukudy. And it would be difficult not to agree with him. The strength shown by Kerala's communities in tiding over the deluge is the sole bright light in an otherwise grave time.



**"Opening dams earlier might have bought some time. Dam storage has reduced because of siltation. As a result, water is stored at dangerous levels. Further, development in the last 20 years has changed land-use and social relations and worsened the inundation"**

**ANIL GUPTA, environment and climatic disaster management division, NIDM**

flood," says Vishwas Kale, a former head of geography department, University of Pune and a hydrology expert, adding that, "the situation cannot be compared to the 1924 floods because the level of infrastructure then wasn't the same as today".

It is clear by this time that while the state was under a heavy spell of rain, the opening of all its dam gates aggravated an already out of control situation. At least 39 dams were full in the range of 85-100 per cent with water by July end. As the August deluge was not expected, the dams were allowed to fill water till the highest level. The rains in August raised safety issues.

So, while the state was already flooded, 35 dams were discharging water, with all their gates opened at the last minute. "The flood damages could have been reduced by 20-40 per cent had the dams and reservoirs released the water slowly in the two week period when the rains had subsided. The state did not have an advanced warning system in place and released water from the dams only once the danger levels (levels at which the dams structures can be damaged) were reached," says Ashok Keshari of Indian Institute of Technology, New Delhi.

As per the Crisis Management Plan for Dam Failures, prepared by the National Committee on Dam Safety, states are supposed to come out with their Emergency Action Plans (EAPs) for every large dam. It's also shocking that cwc had prepared the guidelines for "Development and Implementation of EAPs for Dams" in May 2006 and had circulated it to state

governments for action. According to a recent Comptroller and Auditor General report, out of 61 dams in Kerala, none had EAPS or operation and maintenance manuals.

But before the dam water made the state into a sea, the damage to local ecology done over the years had already caused much devastation. Scanning situation reports of the state's disaster management control room, one pattern clearly emerges: damage to life and property was more in certain areas. These are areas earmarked as ecologically sensitive and have always been cautioned on landslides triggered by rains. In the second and third week of August, mudslides and landslides were reported in 211 places across the state, and this is attributed to increasing stone quarrying activity and large-scale deforestation.

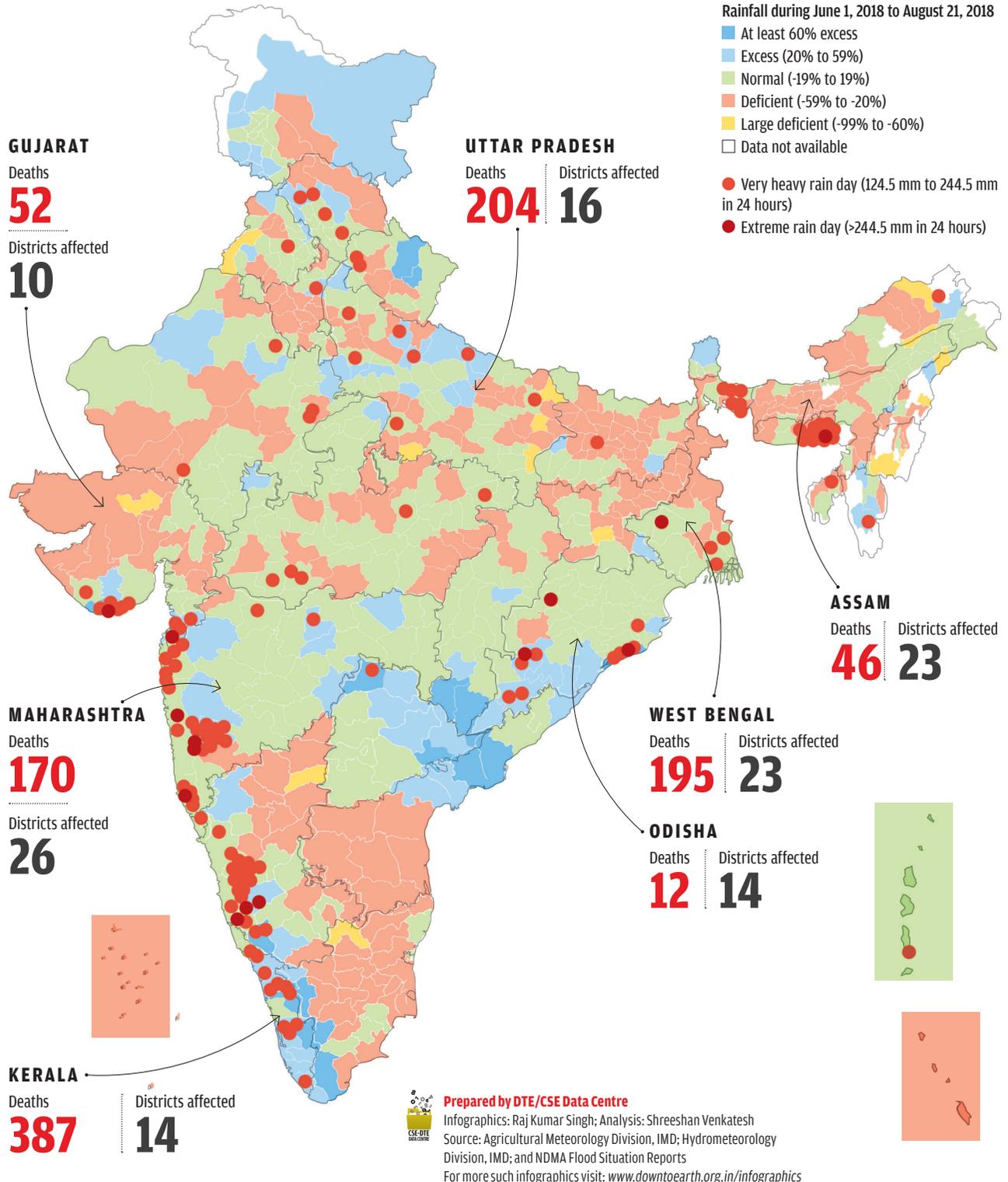
Idukki and Wayanad are considered among the most heavily-forested districts in the state. However, both have seen a decline in their forest cover between 2011 and 2017. The total forest cover in Idukki came down from 3,930 sq km to 3,139 sq km, a decrease of 20.13 per cent. In Wayanad, forests shrunk from 1,775 sq km to 1,580 sq km, a decrease of 11 per cent. This could be the reason these two districts reported the maximum damages due to flash floods and landslides.

By August 22, the state government was still assessing the impacts of the floods. But the meteorological mayhem indicates a new normal fuelled by climate change. This year there has not been a respite from extreme weather events. And it is one of many such episodes playing out across the world now.

MONSOON 2018

# Excess rains plague India

Rainfall during monsoon is becoming more extreme and frequent throughout the country. This is causing floods, claiming lives and damaging property



# Wake up before it is too late

From the US and Europe to Japan and Africa, extreme climate events have become an everyday reality. Managing them is one of the biggest challenges of our times

**E**VEN AS flood waters recede in Kerala and the enormity of the task of rebuilding becomes evident, a similar exercise is unfolding nearly 7,000 km away in western Japan. Between June 28 and July 8, a stationary rainy front, in addition to damp air remaining from the recently-dissipated Typhoon Prapiroon, caused extremely heavy rainfall in western Japan, according to the Japan Meteorological Agency. Total precipitation at many places reached up to four times the mean monthly precipitation for July.

The floods claimed over 200 lives and eight million people were asked to evacuate. However, the process of rebuilding was hampered by another climate anomaly—an intense heat wave that has afflicted the region. Southeast Asia too faced the brunt of flooding with Myanmar, Cambodia, Laos and Thailand recording intense rains and flooding over the past two months.

Weather-wise, the situation has been just as alarming across the globe. 2018 is already one of the hottest years ever recorded. And for this there is no dearth of evidence. As a scorching summer in Asia is followed by intense rainfall and heavy flooding, the other side of the Northern Hemisphere, including North America, Europe and northern Africa, have been in the grip of intense and prolonged heat waves. Temperatures have been soaring above the normal range for

nearly six months now, breaking records in several places, including some in South America. Before the mercury rose, the Northern Hemisphere winter too was erratic bringing rains to Europe and blizzards to North America. Expectedly, the wildfire season has been quite active in both continents. The Australian summer early this year too saw unprecedented temperatures and wildfires. However, what has taken observers by surprise is that the upper limit of forest fires and wildfires has now breached the Arctic Circle with around 50 wildfires being reported from the Scandinavian region during summer. Sea ice coverage around both poles have shrunk considerably as temperatures several degrees above average have been recorded over the year.

The overarching source linking these separate instances of extreme and unpredictable weather anomalies has been identified high up in the atmosphere. The jet stream—a ribbon of high velocity winds that circulate around the Earth several kilometres above the surface—has been deviating from its beaten path. The jet stream in recent times has been observed to be undulating in sharp loops towards the poles and the equator, rather than its normal path which is nowhere nearly as convoluted. The reason for the change in the jet stream paths is ostensibly the increase in global temperatures and the reduction in the gradient between polar and equatorial temperatures which influence the direction of the jet streams. The dust storms and intense convective activity across the Indo-Gangetic plains in April and May 2018 is, in part, attributed to this recent contortion in the jet stream path.

**Long-term predictions, which give the illusion of climate impact being several decades away and ameliorate the urgency of climate action, are already reflecting in extreme events across the world**

# TRAINING ON URBAN WETLANDS MANAGEMENT

## Towards Water and Environment Sustainability

Date: 25 September to 28 September, 2018

Venue: Anil Agarwal Environment Training Institute (AAETI), Nimli, Rajasthan

### ABOUT THE TRAINING

In the wake of frequent recent floods in several urban localities in India as well as international recognition of urban wetlands significant role in water and sanitation management, IUCN has dedicated this year to Wetlands for Sustainable Urban Future, the School of Water and Waste, AAETI, Centre for Science and Environment (CSE) is organizing a four days training on Urban Wetlands Management. The participants will have the opportunity to interact with resource persons from both international and national institutions in this field such as IUCN, NEERI, Biome Environmental Solutions (BES), Centre for Inland Waters in South Asia (CIWSA), Wetlands International South Asia and Indian National Trust for Art and Cultural Heritage (INTACH).

### AIM

The aim of the training is to develop capacity of various stakeholders on conservation, restoration, planning and management of wetlands for water and environmental sustainability in urban areas.

### OBJECTIVES

- Improved knowledge on urban wetlands management - the concepts, tools and techniques.
- Develop skills in mapping of wetlands
- Understanding of wetlands as a source of urban water supply, groundwater recharge and wastewater treatment
- Prepare Urban Wetland /Lake /Flood plain Management Plan.

### WHO CAN APPLY AND HOW TO APPLY?

Government and non-government officials working on wetlands including lake development and management. Independent consultants, representatives from NGOs and researchers working in relevant area.

For filling the application form for registration and scholarship, visit : <https://www.cseindia.org/training-on-urban-wetlands-management-8852>

Full fellowship includes travel, boarding & lodging costs and training kit & fees costs.

Part fellowship includes boarding & lodging costs and training kit & fees costs.

Only the short-listed candidates will be informed and the selection decision of School Committee would be final.

### COURSE COORDINATOR

**Chhavi Sharda**, Email: [chhavi@cseindia.org](mailto:chhavi@cseindia.org), +91-11-40616000 (Ext: 244)

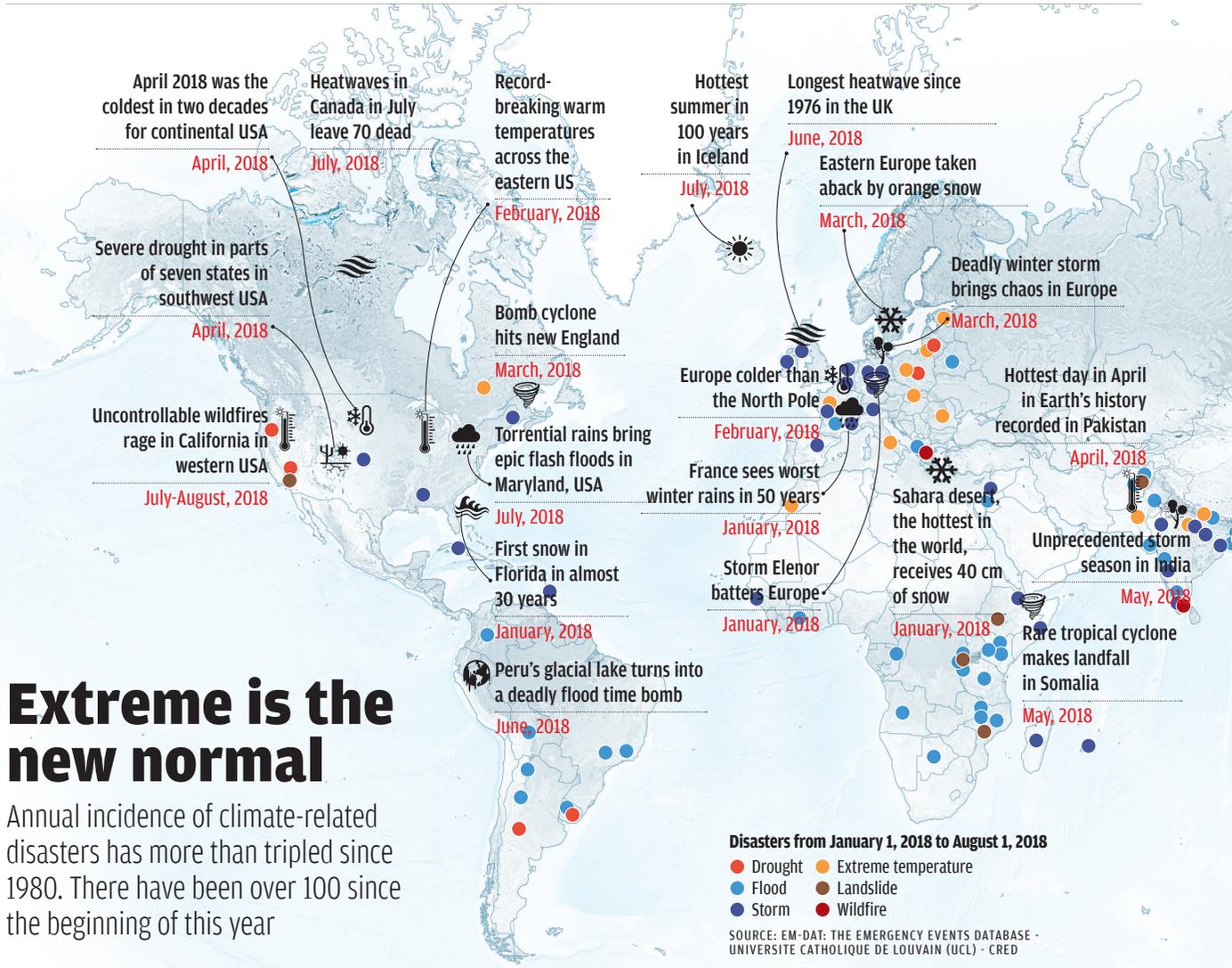
**Rudresh Kumar Sugam**, Co-lead, Email: [rudresh.sugam@cseindia.org](mailto:rudresh.sugam@cseindia.org)

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# Extreme is the new normal

Annual incidence of climate-related disasters has more than tripled since 1980. There have been over 100 since the beginning of this year

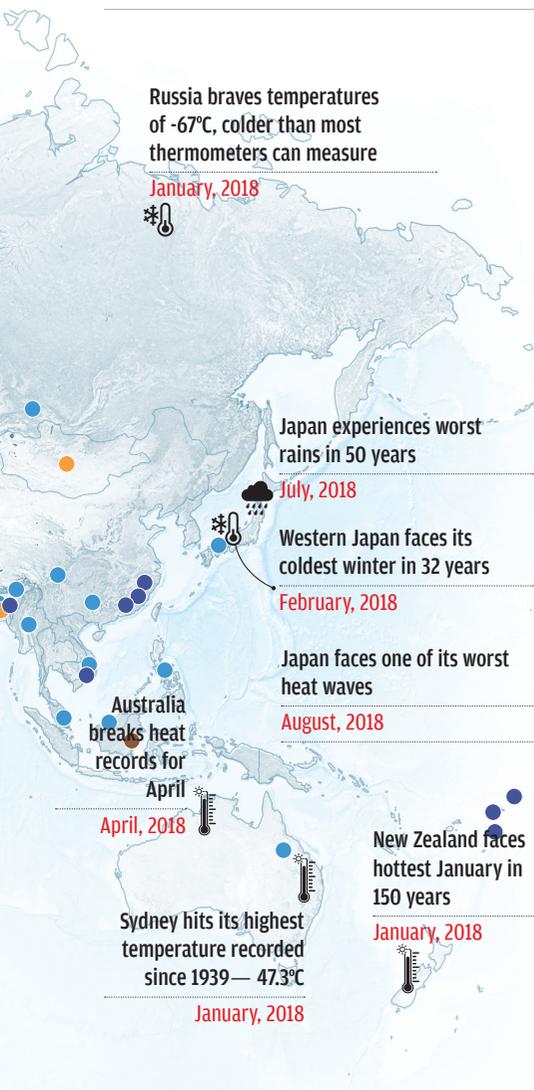
## Already in the midst

The striking reality of climate change is that its impacts are already visible in every corner of the world. This is not some far-fetched prediction but is already happening all around us. The distribution of extreme weather and climatological events since the beginning of the year is evidence of exactly this—not a single region of the world can claim to be insulated from the climate change disturbances. According to the EM-DAT disaster database based in Belgium, there have been over 100 climate-related disasters until the beginning of August this year in which close to 3,000 people died (see ‘Extreme is the new normal’).

A look at the trend of reported natural disasters over the past four decades paints an even starker picture. The incidence of climate-related disasters since 1980 have

more than tripled to over 300 events every year. Both meteorological and hydrological disasters such as storms, extreme precipitation and floods have increased by as much as four times in the 40-year period.

As climate change impacts increase in frequency and intensity, the most worrying thing is that Earth is only about 1° C warmer than it was in the 1950s, and that it is firmly on a trajectory that will be between 3-4° C warmer by 2100. A recent paper published in the journal *PNAS* in August 2018 looked at historical glacial-interglacial cycles the Earth has undergone, and compared it with a theoretical estimation of future climatological cycles through a systems approach if global warming is not contained. The paper suggests that “the Earth System may be approaching a planetary threshold that could lock in a



continuing rapid pathway toward much hotter conditions—Hothouse Earth. This pathway would be propelled by strong, intrinsic, biogeophysical feedbacks difficult to influence by human actions, a pathway that could not be reversed, steered, or substantially slowed. Where such a threshold might be uncertain, but it could be only decades ahead at a temperature rise of 2.0° C above preindustrial, and thus, it could be within the range of the Paris Accord temperature targets”.

The paper’s conclusion is undoubtedly scary, but there isn’t much evidence to counter the inference that the researchers have reached. The *PNAS* paper is a timely publication; in some ways is an apt curtain raiser for the much-awaited Intergovernmental Panel on Climate Change’s (IPCC) 1.5 Degree Special Report.

This report may well determine the urgency and efficacy of the post-Paris Agreement climate action.

While the final version of the report will only be published this month, a preliminary draft was leaked earlier this year. Average temperature rise globally has escalated year-on-year, especially since the 1990s and is currently close to 1.2° C above the pre-industrial average. Around the Arctic Circle, the increase is around 4° C above pre-industrial levels. The leaked version of the Special Report unsurprisingly suggests that the Earth is on its way to breach the lower limit for warming of 1.5° C set under the Paris Agreement. The report points out that though limiting warming to 1.5° C is still geophysically possible, but it would require drastic and rapid reductions in greenhouse gas (GHG) emissions by governments which would include a sharp shift from fossil fuels as well as removal of carbon dioxide (CO<sub>2</sub>) from the atmosphere.

According to the draft, humanity can emit just 580 billion tonnes of CO<sub>2</sub> equivalent of GHG to get a better than 50 per cent chance of limiting warming to 1.5° C. At the current rate of emissions, this is roughly 12-16 years from now. In 2016 alone, 53.4 billion tonnes of CO<sub>2</sub> equivalent GHGs were emitted globally. The draft has warned that adhering to the limit would require a shift towards renewable as the dominant source of energy, coupled with efforts to increase forest cover and other carbon sinks to sequester GHGs. According to the authors, any emission pathway with greater-than-50 per cent chance of limiting warming to under 1.5° C until the end of the century would require the world to reach net-zero emissions around mid-century.

While the urgency of the situation is clear—both from the science of climate change as well as from mounting climatic experiences across the world—the emission pathways currently underway will hardly change the trajectory of global warming. One can only hope that the next rounds of climate change negotiations will include the urgency of addressing the dawning realities of the Anthropocene. ■ [@down2earthindia](https://twitter.com/down2earthindia)

# The search for utopia

*The fool doth think he is wise,  
but the wise man knows  
himself to be a fool...*  
William Shakespeare,  
*As You Like It*, Act V, Scene I

The real value and message of utopia is this: shake off the inertia and act!

**RAKESH KALSHIAN**

**T**HIS JUNE, some people got wind of an officially sanctioned plot to butcher thousands of trees, many over 50 years old, as part of an ambitious plan to redesign some of the oldest government housing colonies in New Delhi. On their ruins would appear modern complexes of high-rise apartments, offices and shopping arcades. Official apology for this arboreal carnage: shortage of housing for public servants. And official indemnity: plant 10 times the number of axed trees in another place.

As the news spread on the WhatsApp grapevine, it galvanised hundreds of citizens who cared to come out and protest. Activists dug up seedy details about violations of various laws and procedures. Among other embarrassments, the project's Environment Impact Assessment (EIA), a legal document, had data copy-pasted from an EIA for a project in Tamil Nadu, a fact that would be hilarious were it not so banal. Alongside, the activists also moved the courts, which stayed the project till the proponents could defend it as legally kosher.

Before long, what began as a pure emotional backlash against the fortuitous slaughter of trees turned into a full-fledged interrogation of the project's *raison d'être*. Indeed, unbeknownst to the campaigners, they had opened a Pandora's box of difficult, yet inescapable conundrums about class and power, democracy and gover-



nance, freedom and equality, aesthetics and sustainability.

### Visions of perfection

At a symposium titled “Political Economy of Redevelopment”—held recently in Delhi last month—one speaker, a former head of the Urban Arts Commission of Delhi, bemoaned the brazen defiance of laws when it came to redesigning city spaces. A

third speaker argued that going vertical is the only way to provide housing to rising numbers without straining urban resources to the limit. A fourth speaker broached the question of class, arguing that trees are important but much less than decent housing for all. He claimed that the present model is flawed and that for cities to be sustainable, all of us will have to make do with modest-sized homes.

Evidently, people had different ideas about what an ideal city might look like, but almost everybody seemed to agree that the real challenge lay in designing cities in which people live in harmony not only with nature but also with each other.

This is precisely the problem that Paolo Soleri, the well-known Italian architect, grappled with in the 1960s and 70s. For Soleri, architecture and nature were entwined in a harmonious braid.

He wanted to know if an architect could design an urban utopia from scratch or whether it would emerge organically from an interweaving of economic and ecological yarns? One can see his unfinished quest in a place called Arcosanti, near Phoenix, Arizona. Built originally for about 5,000 artists/artisans, only 80 people live in a close-knit complex designed to maximise energy efficiency. The artisans grow their own food and sell cast bells to maintain the complex.

The city is a just one motif in a nation’s complex pattern. In the ever-dynamic complex web that a nation is, a city is inextricably enmeshed in the socio-economic, political, and ecological life of other geographies. So an urban utopia cannot but be subsumed by a national utopia.

The recently published book *Alternative futures: India Unshackled* is a valiant attempt to imagine alternative futures for India in its totality. Edited by Ashish Kothari and KJ Joy, the book is an anthology of about 30 separate dreams (more being dreamt of, we are told) about what India should look like in 2100. Two threads run through each individual dream: justice—social, economic and political, and ecological integrity. For imagining their utopia, the editors asked the chosen dreamers, majority of them grassroots activists, to explore wellsprings of utopian ideas other than the much-mined ideologies of Marxism and Gandhism. Kothari says the book is a sort of answer to all those who, tired of the carping criticism of government policies, would often retort: but what is your alternative?

### Tapestry of landscape

For instance, in the dreams of Kartik Shankar, editor of *Current Conservation*, and others, India’s future conservation, contrary to the current paradigm of divorcing people from wildlife habitats, appear as a land-



ILLUSTRATIONS: TARIQUE AZIZ / CSE

scape where myriad social and ecological elements dance together to create an ever-changing tapestry of biodiversity. This would entail creating a much greater pool of commons stewarded by “nested democratic institutions,” including local communities. Needless to say, current economic growth models will have to go for the sake of a more vibrant biodiversity.

Gladson Dungdung, a Kharia Adivasi activist from Jharkhand, dreams of Adivasi future in which they have reclaimed their rights over lands usurped by others as well as the right to self-determination with respect to their culture and language.

Arpitha Kodevari imagines India’s future legal system where citizens are active participants not only in making laws but also in resolving disputes. She would like to see the creation of mediation centres where an enduring conversation between law and society will “bring out layers and complex notions of identity”.

For Dunu Roy, who runs the Hazards Centre in Delhi which sup-



**Kothari says the book is a sort of answer to all those who, tired of the carping criticism of government policies, would often retort: but what is your alternative?**

ports community struggles, the good dream for India’s future workers where industrial work is neither precarious nor does it cause social and environment damage through evasion of hidden costs of undue capital accumulation, it is essential to do away with the twin fetish of competition and profit.

Activists Pallav Das and M P Parmeswaran dream, separately, of a future where village communities have fashioned a robust self-rule through creating a common pool of private farmlands while maintaining a tenuous yet formal relationship with

the state. Das celebrates the example of Mendha Lekha, a tribal village in Gadchiroli district of Maharashtra, which in 2013 decided to transfer all its individual farmlands to the Gram Sabha. Both believe this is the future ideal model for achieving self-reliance and resilience.

But of all the dreams in the book, Dalit activist Anand Teltumbde’s dream of Dalit future seems to be the most radical. He imagines a time when castes themselves, and not just caste-discrimination (which already is), are outlawed; reservations are delinked from caste; caste-based

political reservations are abolished; first-past-the-post electoral regime is replaced with proportional representation; private property in farmlands is abolished; schools are created where kids from across the class spectrum can study; and, a universal public healthcare system is put in place, among others.

If Teltumbde’s Dalit dream is the most radical, human rights activist Arvind Narrain’s about the future of love, dissent and empathy is the most eloquent and poignant. Through the benighted lives of two Bengali women lovers, Swapna and Sucheta, who, unable to bear humiliation at the hands of bigots, commit suicide, and of the US marine and queer Chelsea Manning, who was sentenced to 35 years in prison because he had passed on sensitive military data to wikileaks,

Narrain builds a persuasive case for two kinds of love that imbue life with meaning. “The first,” he writes, “is the notion of love for one person and second is the notion of love in wider sense, which can be characterized as the love of justice or empathy for the suffering other.” He argues and believes that “utopia would surely be a state where the human heart is moved by all forms of suffering”.

### Little overlap

Ironically, however, the book, even though it touches upon most facets of Indian society, leaves the reader feeling like the proverbial blind man who describes an elephant by so many different names except the thing itself as he touches different parts of its body. This is partly because, unlike most utopias, the utopia, or utopias, in question is the imagination of not one but many minds with little or no overlap. The only thread running through most, if not all, pieces is that of justice, social, economic, political, and ecological integrity.

So willy-nilly the dream about India’s future ecology skirts around the questions of economy or politics. Likewise, the dream about India’s future cities does not address the fraught relationship between city and countryside. The dream about or Dalit futures doesn’t engage with the idea of cosmopolitanism. Therefore, critical questions that any perplexed observer might ask of contemporary India are left hanging in mid-air. Questions like: should English be the medium of instruction in schools and colleges? What kind of technologies should one embrace, and who would decide that? Who will decide how much is enough?

Most of the dreamers being grass-roots activists, the prose in all but a couple of pieces tends to be plodding and didactic. Curiously, besides, none of the essays are composed in the first

person considering they reflect personal dreams of the authors. This, unfortunately, renders them uninspiring, at least for yours truly. Nonetheless, the dreams in themselves are useful windows, at least for policymakers and activists, into the anxieties and flaws of the present as well as into possibilities for the future.

The timing of the book is opportune as it reflects the zeitgeist of our times, which is fraught with an almost universal feeling of gloom and doom and marked by multiple crises—notably, persistent joblessness, deepening inequality, religious and racial fundamentalism, not to mention the forebodings of a warming planet.

Talking about the crisis of climate change, it is conspicuously absent in

Anthropocene while I might dream of remaking the world based on traditional wisdom. You may want to empty half the earth of humans in order to protect endangered species, while I might put my money on reviving extinct species.

This is clearly frustrating. So what does one do in the face of such ideological chaos, except perhaps escape into a burrow of personal utopian fantasy? Maybe that’s one desperate way of preserving what one considers to be at stake in the Anthropocene—a way of life that enshrines certain political, ethical and aesthetic values. As the American professor of law, Jedediah Purdy, argues in *After Nature*, any reworking of the Anthropocene “will answer questions about what life is

## Climate change is conspicuously absent in the book. So is, oddly enough, science. Needless to say, both have a significant bearing on our lives, and hence should have been assigned a dreamer

the book. So is, oddly enough, science. Needless to say, both have a significant bearing on our lives, and hence should have been assigned a dreamer.

Climate change in particular poses an unprecedented conundrum for any dreamer. It’s possible, and is perhaps desirable too, to have dreams specific to particular nation-states, as we can at least fight in making them come true. But climate change knows no national borders—the life of anyone anywhere on the planet affects, positively or negatively, the lives of everyone else on the planet. So it may not be enough for an Indian, for instance, to dream the future of India’s climate if others are not part of her dream too.

Put another way, in theory there could be millions of dreams of a future Anthropocene, the epoch where the line between the natural and the human is now a blur. You may put faith in science to sculpt a new

worth, what people owe one another, and what in the world is awesome or beautiful enough to preserve or (re) create. Either the answers will reproduce and amplify existing inequality or they will set in motion a different logic of power. Either the Anthropocene will be democratic or it will be horrible”.

### Realistically speaking

Either way, utopia is about fears, dreams and desires, and it can take many forms, like fiction, philosophy, cinema and political theory. It can also be expressed as a lived experiment, such as intentional communities (like Auroville in Pudduchery or Christiania in Copenhagen), or architectural adventures (like Soleri’s Arcosanti), or even individuals living a life inspired by utopian principles (such as someone choosing to live in the forest).

Plato's *The Republic*, Thomas More's *Utopia* (1516), William Morris' *News from Nowhere*, are some earlier examples of utopias that imagined new possibilities based on a considered critique of the present. For instance, Morris' novel was an interrogation of how notions of work, labour, capital, and technology shaped society of his time.

Recent utopian fictions are often speculative reflections on the existential angst about capitalism, globalisation and environment. For instance, Kim Stanley Robinson, arguably the most prolific living author of utopian fiction, in his *Mars* trilogy, explores the dangers of our blind faith in science and capitalism. Dismayingly, he portrays human nature as incorrigibly morally ambivalent. As a warming Earth causes the sea to bloat and eat up large tracts of land, a group of scientists are commissioned to set up a colony on Mars. One would imagine the supposedly wised-up humans would create a better and saner new world in the light of what they did to the Earth, but, alas, they (mostly politicians, for Robinson has a benign view of science and scientists) continue to be bedevilled by greed, corruption, and Machiavellian politics.

In her insightful *Fool's Gold?: Utopianism in the Twenty First Century*, Lucy Sargisson observes that "most contemporary utopias avoid depicting a single solution; they decline to offer one complete and finished vision of the good life". Besides, they tend to be a mix of utopias and dystopias. *Alternative Futures* falls somewhere in the middle—while it doesn't offer a single solution, it does insist on a comprehensive unshackling. As Kothari said in an interview to mongabay.com: "Its central thread is that without a significant transformation along all the axes, no isolated attempt at creating greater justice, equality, and ecological sustainability

will be successful in the long run."

Some scholars, however, take a dim view of utopias, especially the ones that offer a totalising vision. British philosopher John Gray believes the trouble is that all utopias seek harmony, which goes against the grain of human nature, which thrives on conflict. As he writes in *Black Mass: Apocalyptic Religion and the Death of Utopia*: "If humans differ from other animals, it is partly in their conflicts of interests. They crave security, but they are easily bored; they are peace-loving animals, but they have an itch for violence; they are drawn to thinking, but at the same time, they hate and fear the unsettling thinking brings. There is no way of life in

ical and/or experimental?"

While utopias that seek perfection and demand quick translation into reality are probably dangerous, there are other kinds that serve not just as guiding lights or mirrors that reflect inconvenient truths about the present, but also as catalysts of radical change. Robinson's prophetic words, excerpted from his *Science in the Capital* trilogy, about capitalism and climate change in the US can be viewed as a cautionary tale for any society trapped in the current economic paradigm.

"They went too far in this administration. Their line was that no one knew for sure [about global warming] and it would be much too expen-

**The timing of the book is opportune as it reflects the zeitgeist of our times, which is fraught with an almost universal feeling of gloom and doom and marked by multiple crises**

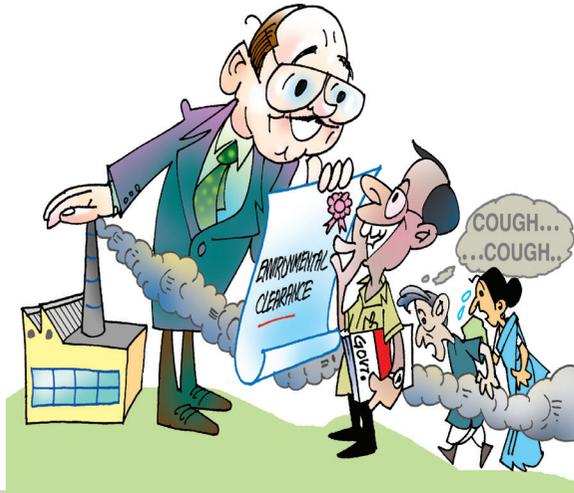
which all these needs can be satisfied."

This brings us to the question of what use utopias might be put to, especially the ones sketched out in Kothari's book that dream of a total change, if it isn't endorsed and sponsored by the State? As Kothari himself admits in the book, "We are constantly made aware of how serious a situation we are in, how difficult it is to make even small changes and sustain them... and for those with historical knowledge, how many revolutions have started with similar visions but failed to achieve them."

That, according to Sargisson "depends whether a utopia is the vision of one person or many, a leader or a group of people. The context matters too; is it hierarchical, consensual, cooperative, collaborative, egalitarian, exploitative, capitalist or anarchistic? And intent is crucial. Does this utopia seek realisation? Perfection? To explore ideas? Is it oppositional, crit-

sive to do anything about it even if they were certain it was coming—everything would have to change, the power system, cars, a shift from hydrocarbons to helium or something, they didn't know, and they didn't own patents or already existing infrastructures for that sort of thing, so they were going to dodge the issue and let the next generation solve their own problems in their own time. In other words, the hell with them. Easier to destroy the world bit by bit than to change capitalism even one little bit." Therein lies the real value and message of utopia—an urgent call to shun inertia and act! To quote Samuel Beckett from *Westward Ho!* "Ever tried. Ever failed. No matter. Try again. Fail again. Fail better." And therein lies perhaps the real value and message of utopia, and hence of *Alternative Futures*—an urgent call to shake off inertia and act. ■

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PATENTLY ABSURD LATHA JISHNU

## Where India fears to tread

Even rich nations are using compulsory licences to ensure cheaper life-saving drugs for public healthcare unlike India

**F**IRST IT was Germany and now Russia. As prices of life-saving medicines, especially those for treating cancer skyrocket, rich nations are now resorting to a measure they once opposed strenuously: the use of compulsory licences (CLs). A CL is a legal way to override patents to allow countries to produce cheaper versions of a product, usually medicines, by paying a fixed royalty to the patent holder. All these years, developed countries have opposed the use of CLs by poor countries because they claimed it undermined the rationale of intellectual property (IP) protection. But they were protecting the profits of the powerful innovator drug companies.

Increasingly, as prices of new generation drugs become prohibitive, even the most developed nations are finding it impossible to include such drugs in their public healthcare programmes. Not even the US, the UK or Germany can afford to provide a drug that costs as much as US \$1,000 a pop or \$84,000 for a 12-week treatment of hepatitis C. New cancer drugs are priced in the same range. In the 1990s, a clutch of developing countries fighting the HIV/AIDS epidemic had sought to use CLs to provide less expensive generic versions of costly patented drugs but were vigorously opposed by the US and other developed countries. Now, the economics of public healthcare is forcing them to follow suit.

In June this year, Russia issued its first CL when the Arbitration Court of Moscow granted the request of Russian pharma company Nativa to produce the generic version of US drug company Celgene's formulation lenalidomide. Marketed as

Revlimid, lenalidomide is used to treat multiple myeloma, a type of blood cancer. Revlimid is a blockbuster drug that earned Celgene \$8.2 billion in revenues in 2017. In March last year, Celgene filed a case against Nativa seeking a ban on the production and sale of its analogue of Revlimid. Nativa then filed a counter claim for a CL from the court to continue producing the drug for the Russian market at significantly lower prices.

In Russia, unlike elsewhere, it is only the court that can grant a CL. In its decision, the court said the CL was being granted in national interest and because public health is a socially significant issue. The CL comes at a time when the Russian government is subject to tough economic sanctions imposed by the US and the European Union and could come under further restrictions. Russia is taking measures to tighten its IP protection laws that will give the government's anti-monopoly agency full

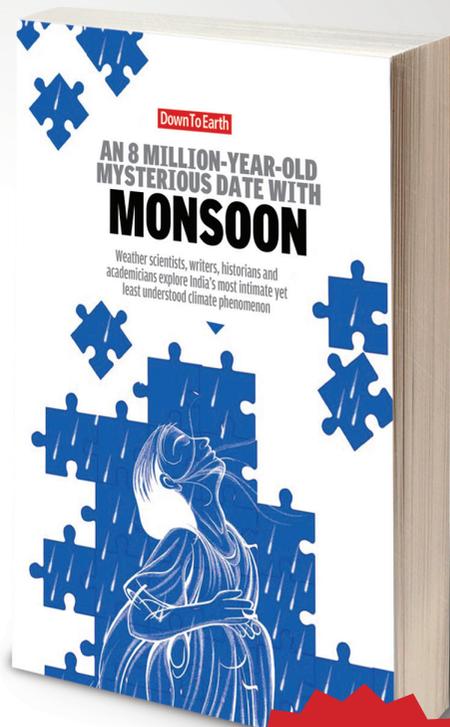
powers to grant CLs and is clearly backing its pharmaceutical industry as long as it operates within the law. Nativa has been told to pay a pretty high royalty rate of 30 per cent to Celgene. Expectedly, PhRMA, the powerful lobby of US multinational drug makers, has started a campaign against the proposed changes in Russia's IP law.

If Russia is showing that it's determined to provide more affordable drugs to protect public health, such a resolve is missing in India where the Narendra Modi regime has given in to US pressure and rejected pleas for CLs. The first and only CL was issued in 2012. ■

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# Prisoner of Contradictions

India's only wetland cat is under multiple threats

TIASA ADHYA | KOLKATA

**F**ISHING CAT is a symbolic species of floodplains, deltas and coastal wetlands of South and Southeast Asia. They have a patchy distribution from Sind in Pakistan to Cambodia. The South Asian countries of India, Nepal, Bangladesh and Sri Lanka hold the core of the global Fishing Cat population. In India, it is largely re-

stricted to the floodplains of Ganga, Yamuna, Brahmaputra, Sundarbans Delta and smaller coastal wetlands along the Bay of Bengal formed by Mahanadi, Godavari and Krishna rivers. As these areas are biologically productive, they have attracted human civilisation for colonisation and food production and this has put the Fishing Cat under threat.

## Development: the biggest threat

Habitat loss due to development activities is the number one threat to the Fishing Cat. This is happening mainly due to contradictions in policies. India is a signatory to the Ramsar Convention on Wetlands and considers “marshlands” (Fishing Cat habitat) as wetlands. Even our Central Wetland Rules, 2017 give it the same recognition. However, the Wasteland Atlas of India, 2010, considers them as “wastelands”. As a result, the Union Ministry of Water Resources has recommended that waterlogged areas should be reclaimed as per its Command Area Development and Water Management Programme. Big pisciculture farms instead come up replacing natural riparian vegetation. The Fishing Cat has disappeared from the East Kolkata Wetlands due to intensive aquaculture—the last dead cat was found in 2012. Shrimp farming is another growing threat to mangrove habitats of the Fishing Cat. Between 1989 and 1999, shrimp farms increased by 10 times in the Godavari region by eradicating mangroves.

Private ownership of ponds and aquaculture leaves very little room for tolerance. Yet this intolerance was not always so. You can still see the Fishing Cat engraved in the structure of Angkor Wat on the floodplains of Mekong. So they must have co-inhabited spaces from time immemorial. This unique cat also faces threats from hunting for meat and skin. Tribal hunters indulge in ritual hunting practices throughout the year. These are serious problems as the cats are restricted to remnant patches and a single bout of hunting can wipe out a population from a patch.

## Conservation efforts

The Fishing Cat Project, a part of The Fishing Cat Working Group (Small Wild Cat Conservation Foundation), that began in 2010 gave some recognition to the cat. In 2012, the West

Bengal government officially declared the Fishing Cat as the State Animal and the Calcutta Zoo has two big enclosures dedicated to them. The government also formed Fishing Cat Protection Committees in all blocks of Howrah district. All three tiers of the rural councils were involved in Fishing Cat awareness generation. From 2016, a programme called “Know Thy Neighbours” (a Fishing Cat monitoring protocol by the community) was initiated under which enthusiastic residents were given a camera trap so that they could monitor their backyard cats. They were also trained on how to identify different individuals and then encouraged them to name them.

In a little village named Maheshpur, a group of students in the age group of 10-15, got really attached to

two female cats they could identify and name—Rumki and Chumki. So when the reeds (where the cats stay and which are cultivated annually) were cut, Rumki and Chumki could not be traced and the kids became worried. After a month and a half, when the reeds began to grow back, Rumki and Chumki were again detected and the children were full of joy.

The Fishing Cat Project provided scientific evidence of the cat's presence repeatedly for legal battles taken up by PUBLIC, a non-profit which works on environmental issues in and around Kolkata, to safeguard wetlands. Another non-profit Human & Environment Alliance League (HEAL) is working on documenting the remaining marshy patches in south Bengal along with the Fishing Cat Project—the plan being to work with implementing agencies to safeguard these

habitats from development.

To curb ritualistic hunting of Fishing Cat, HEAL launched Zero Hunting Alliance—a platform where civic volunteers could work with enforcement agencies to implement anti-hunting strategies. With the Calcutta High Court's support, the group works with the Forest, Railways and Police departments to curb hunting. The motto of the alliance is to convert tribal hunters from being adversaries of conservationists to their allies.

In Odisha, Wild Orissa, a non-profit, and Mahavir Pakshi Suraksha Samity (a group of erstwhile poachers) are involved in Fishing Cat research work. The Godavari Fishing Cat Project and the Eastern Ghats Wildlife Society is also doing commendable grassroots conservation work.

## The Fishing Cat faces threats from hunting for meat and skin. Tribal hunters indulge in ritual hunting practices throughout the year. These are serious problems as the cats are restricted to remnant patches and a single bout of hunting can wipe out a population from a patch locally

According to McKinsey Global Institute's report “India's urban awakening: Building inclusive cities, sustaining economic growth”, 2010, a new Chicago city will be built each year in India and transport infrastructure is set to increase by 20 times. Where will the land for this come from since it is a finite resource?

Despite multiple threats, the Fishing Cat was recently downlisted to “Vulnerable” from “Endangered” in the IUCN Red List species assessment. Clearly, the assessors lack the foresight of veteran ecologists. Wildlife scientist George Schaller says, “IUCN downlists species merely on the basis of numbers rather than also taking habitat fragmentation and immediate future threats into consideration.” ■

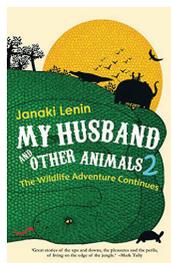
*The author is co-founder of The Fishing Cat Project (Small Wild Cat Conservation Foundation)*



# Bizarre, serious, jocular

Janaki Lenin captures the animal (and human) world in all its mystique and charm

RAJAT GHAI



MY HUSBAND AND OTHER ANIMALS 2: THE WILDLIFE ADVENTURE CONTINUES

Janaki Lenin

Westland | 329 pages | ₹ 299

**J**ANKI LENIN describes her experiences of living with veteran herpetologist, Romulus Whitaker, in this sequel *My husband and other animals 2: The wildlife adventure continues*. Through these 81 stories, we not only learn about unknown facets about mammals, reptiles, birds, amphibians and fish, but also about what it is to be human. Each story is peppered with astute observations, logical inquiry and deduction, light-hearted humour, serious insights and most of all, overarching curiosity about the world around us and the secrets that it seemingly hides.

For instance, did you know that palm civets are crazy about toddy and coffee? Or that humans can “unlearn” their fear of snakes. One of the names of the King Cobra is the Hamadryad, Greek for “nymph of the woods”, given to it by Danish scientist Theodore Edward Cantor for its extraordinary physical beauty. Donkeys can give humans

TARIQUE AZIZ / CSE



rabid bites. Bull crocodiles are caring fathers. As are male tigers and leopards, contrary to conventional wisdom. Crocodylians can climb well, with the mugger or the marsh crocodile of the Subcontinent leading the pack. Some carnivores are frugivorous too. And Leatherback turtles, the largest in the world, regularly cross oceans.

Some of these stories may sound bizarre, but are, in fact, proof of the keen observational skills of the author. Take for example the two stories on poop. In one, Lenin writes how many animal species, ranging from lagomorphs like hares to dogs to iguanas and pigs eat their own and other species' faeces since it gives them nutritional supplements or even gut flora.

Lenin also writes on two topics about the human condition. In "Why do Men Rape?" she examines corresponding examples from other animal species and shows that non-human males also rape; these include drakes, ganders, orangutans and bottle nose dolphins. She compares scientific literature on rape and deliberates on the age-old question: is rape about sex and innate behaviour or is it about power and learnt behaviour? She concludes that we cannot take these two exclusively. Rather, rape is a product of both these two phenomena.

In her two stories about homosexuality, Lenin is very clear: homosexuality cannot be against the order of nature. She concludes that there is no one single explanation yet as to why homosexual behaviour evolved in human and non-human species.

Some pieces are very dark. For instance, in "The High Price of Sex", Lenin writes about a male King Cobra killing and nearly devouring his own mate. King Cobras are snake eaters is well-known. Their very scientific name is testament to that: *Ophiophagus Hannah*, snake eater. But the fact that they can eat each other came as a dark surprise.

There are essays that also show how dangerous working with animals is. Sample this: "One basking croc suddenly woke up to find a human (Rom) almost nose to nose, taking its picture. When it dove under the coracle (boat), the pointy scales on its back rubbed rat-a-tat against the bamboo ribs."

In the end though, the book is a homage to Rom Whitaker. The book reveals some hitherto unknown facts about his life. Like when he was bitten by a prairie rattlesnake in Texas in 1966, he had to become a lab rat for an experimental treatment called cryotherapy involving ice. Whitaker consequently lost the use of his right index finger. A few years later, cryotherapy was discredited. Or that he gave up his US citizenship and took up Indian citizenship in 1975 to study the fauna of the Andaman and Nicobar Islands, which were then off-limits to foreign nationals. The book is easy to read, jocular, serious, trivial as well as detailed. Go for it. ■

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## 'Urbanites have poor wildlife understanding'

JANAKI LENIN speaks to *Down To Earth*

### How different is this book from the earlier one?

It's similar to the extent that it's another collection of essays about animals, people, and my husband. To a greater degree, readers influenced the kind of topics I deal with in this second book, so it has a different feel and tone.



### Do you think more young people in India today think of wildlife conservation as a career?

I guess so. While it's nice to see their concern for conservation, there's also another side. Conservation is not just about campaigning for wildlife and habitats. There's a quote that goes something like this: conservation is 95 per cent working with people. And this is what we don't do well.

Most of these young people live in cities where they are not only insulated from the real world difficulties of living with wildlife, but they are also unsympathetic towards those whose livelihoods and lives are on the line. Much of their understanding of the issues is shallow. This combination of lack of sympathy and ignorance can make conservation policy and management difficult.

Urbanites, in our arrogance, think rural communities are ignorant at best or dangerous at worst to wildlife. They are the soft targets. Many of these rural communities adjust to make space for various species at some cost to themselves. We don't even recognise this, let alone celebrate them. We have to make them equal partners in conservation.

Conversely, we don't push hard enough when it comes to forces more powerful than us: politicians and corporate houses. The fight against them is led by local communities in places like Niyamgiri, Kutch, and Arunachal Pradesh. So you can see who the real conservationists are. This is not to tar all of them with the same brush. Some young conservationists fight these difficult battles with deftness and sympathy and better than the earlier generations.

### What are your future projects?

I am working with Rom on his memoir and writing a book on the Irulas and their traditional wildlife knowledge.

CIVIL LINES RICHARD MAHAPATRA

# Again, stop talking about GDP

India missed another opportunity to shed its obsession with a bad measure of economy

**INDIA'S ONGOING** bipolarity in political discourse was on display in the past few weeks. A standard exercise to create a comparable data set on gross domestic product (GDP) erupted into a meaningless Congress v BJP duel. In 2015, India changed the methodology to measure GDP. It was but inevitable for normal tracking of the economy to create a comparable data set for years preceding this year. The result showed that the former United Progressive Alliance (UPA) apparently performed better on economic growth than the current National Democratic Alliance (NDA). After intense debates from both sides, the government withdrew the study.

In July, the US also changed certain measures of the economy that led to a change in both the current and the past GDP growth. It showed that the second term of Barack Obama registered a better growth than the Trump regime. But there was no senseless politicking over it. Rather, there was a debate over whether GDP could be the only measure of economy. That is precisely what the current debate in India missed.

GDP as a measure of economy and state of welfare is increasingly being debated. In 2016, then chief statistician of India T CA Anant was quoted in this column saying that GDP was an imperfect indicator. Then, the debate was over the new methodology adopted for measuring India's GDP. Worldwide, economists are questioning GDP more and more as it doesn't show the state of welfare, or to put in simple language, doesn't reflect whether a booming economy results in public welfare. Like, many point out, if India was the fastest growing economy, then why was poverty reduction not proportionately faster or why farmers across the country continue to be distressed?

GDP is not meant to indicate all these as it is not a measure of overall welfare. For example, Kerala's GDP would go up after the flood as there would be fresh investments to rebuild the state. But this does not mean people's lives will improve. For that matter, an unhealthy country would add on to GDP due to people spending more on treatments. Simon Kuznets, who invented GDP, cautioned the US Congress in 1934 that it was an "inaccurate" calculation and was not meant to assess an economy's true welfare nature.

So, why is this obsession with GDP? A higher economic growth has more political meaning than any welfare trickle to the poor. Parties use GDP rate to whip up public passion and reap electoral gains. Particularly, since GDP and liberal economy became global parameters, its political importance too has gone up. It is also being used to attract foreign investments.

The real danger is that obsession with just boosting GDP keeps policy-makers away from relevant economic investments needed to ensure welfare. For instance, investing in a big export-oriented mobile phone factory drives GDP growth, but it cannot match human development in the same way as investment in schools and hospitals. But given the political traction of GDP, a leader would tend to prefer the former. That could be the reason why agriculture trade has gone up in India but we are importing more without substantial domestic investment in the sector.

So, there was an opportunity to turn GDP into a debate over its efficacy. That would have been a sign of a "New India". But by defending first and then withdrawing the report, we just became the usual India for the sake of narrow politicking. ■



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but also installation, operation, maintenance and data handling. Data interpretation is equally important to assess the correct implementation. Therefore, adequate knowledge and skill becomes most crucial factor for industries, regulators and associated parties.

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