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16-31 AUGUST, 2018

Down To Earth

FORTNIGHTLY ON POLITICS OF DEVELOPMENT, ENVIRONMENT AND HEALTH

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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

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CSE

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CHANGE THE CLIMATE NOW

CLIMATE CHANGE is in crescendo. In June and July 2018 some 140 wildfires raged across California; 80 people were killed in similar wildfires in Greece; Europe has been sizzling under heat waves; unseasonal dust storms have killed over 500 in India; torrential rains in Japan and other such extreme rain events are devastating crops and homes across vast parts of the world. All of these weather events are far beyond normal variability, called stationarity, as it followed past patterns. Now we are in the era of the unprecedented and unknown. What we know for certain is that this intensity, variability and ferocity of weird weather will get worse.

The connection with weird weather and climate change is also being seen through studies called attribution. The World Weather Attribution network estimates that climate change has more than "doubled the likelihood of the European heatwave". It has also tripled the likelihood of drought in Cape Town—the South African city that narrowly missed Day Zero, when it would run out of water.

TARIQUE AZIZ / CSE

The question is what now? In the coming month, the Intergovernmental Panel on Climate Change will release its 1.5°C report on the impacts when the world hits this level of temperature rise. The report, as I say, will only state the obvious. If the weather related calamities being experienced at 1°C rise—roughly the temperature increase today over the pre-industrial period—then it would only get weirder and worse. That much is known.

What do we do now? This is where I am clear the crescendo will get discordant. The fact is that we are nowhere close to staying below the 1.5°C guardrail—a temperature increase that was once considered to be relatively safe. We are on fast track to increase emissions and break all temperature barriers. But that is beside the point.

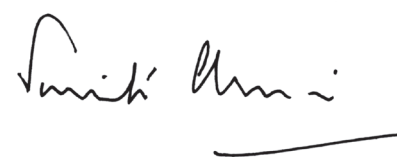
Now that the rich are also being hit by climate change and the "attribution" is clear, the gloves will be off—the targets for the world's derision and anger will be the emerging rich in emerging countries like India. *The Economist* in a recent article talks about how even as Britain enjoyed its first coal-free day since the 1800s, India is burning more coal—and it of course puts this down to the fact that end of coal would destroy the banking system and the railways in the country. We are the cause, not the victims of the world's excesses in pushing emissions that are in the atmosphere today.

The fact is that India and China are aware of emissions from coal burning because of our horrendous air pollution. In India we need to close old and polluting thermal plants; Delhi's Badarpur will be closed this winter; new emission standards must be implemented as early as possible; pet coke has already been banned, including its import from the US. Now we need a massive move to cleaner fuels like renewables or natural gas. This is essential and we will push for it—not for climate change reasons but for cutting air pollution.

But we are not the question. The fact is that the world has completely run out of its carbon budget—it has been occupied by the already rich world for its growth—and now that there is nothing left, we will be told to jump off the bridge. The counter-narration is ready. We will be told first that guilt and repentance is language to avoid as it leads nowhere. Then we will be told even if the problem was created by the rich, we must not follow this pathway. We have the responsibility to act. We owe it to our own children and to the victims of climate change—the poor and the marginalised in our world. The shoe will be on the other foot. We will have the boot.

The problem also is that the world is still not anywhere close to giving up its fossil addiction. For all the talk of renewable energy—other than in Germany where it has been scaled up—it is still at the edge of supply. In fact, in the past year, demand for coal is rising; investment in oil and gas is up and all of the climate change solutions are fighting to survive. It is not working.

But what is really not working is our government. The fact is that countries like India must take the lead to putting forward our vulnerability; the economic and human cost of the climate change "attributed" disasters to the global stage. We must demand that the world acts—at speed and scale. And even as we push for the world to take climate change seriously, we must put forward our own plan—and must have something to show. We need to be decisive in our words and our actions. This whimpering and simpering will not work in our climate-risked world. ■



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MORE FROM US

DTE YOUTUBE

Know about the food you eat

Watch Sunita Narain's video "Our Agenda for Survival" where she questions the government for not allowing citizens to make an informed choice about their food. She says it is our right to demand safe food which does not contain genetically modified (GM) organisms. A recent CSE study, which tested 65 food samples, found 32 per cent of them had GM ingredients. She questions the legality of selling these products in India.

goo.gl/JCnM1U

CSE-DTE DATA CENTRE

Funding dirty energy

Nearly 60 per cent public finance for energy infrastructure in Africa from 2014 to 2016 was for fossil fuel projects. Only 18 per cent was allocated to clean energy.

Extreme is the new normal

What is the link between heavy rainfall in Japan last month and the deaths of 70 people in Canada due to heatwaves? Climate change is causing these events.

www.downtoearth.org.in/infographics

WEB SPECIAL

Tipu's rockets

Archaeologists have found over 1,000 war rockets of Tipu Sultan, the erstwhile ruler of Mysuru, in an abandoned well.

www.downtoearth.org.in

Dry spell in Northeast

The east and the Northeast have received 31 per cent less rainfall than normal this year. This could be the worst monsoon in the past 13 years.

FACEBOOK

90% projects left

Only 849 of the 8,214 projects under the Pradhan Mantri Krishi Sinchayee Yojana have seen official closure till date.

@down2earthindia

GLIMPSES FROM OUR ARCHIVE

Threat of AMR

Antimicrobial resistance (AMR) continues to be a global problem, and most countries, including India, have not done well to address it, says a survey by three international bodies. In *Drugged* (1-15 August, 2014) *Down To Earth* noted that in the absence of data on antibiotic residues, no one knows the extent of AMR. The only planned surveillance of AMR, under the National Programme on Containment on Antimicrobial Resistance, 2012-2017, has not started.

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letters

Welcome change

As a reader of *Down To Earth* for many years now, I see a remarkable improvement in your news pages or "The Fortnight". Last year, these pages were very few sometimes, and had less important or interesting stories. The selection of the stories this year is a great reflection of the developments happening around the world related to agriculture, innovation and politics. I really liked "Broke-ing bad" (16-30 June, 2018) for its right amount of wit and information which made it an interesting read.

KONDA SOMNA
CHENNAI

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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Patently incorrect

Several points mentioned in the letter "Looming danger" (16-30 June, 2018) are patently incorrect. The India-based Neutrino Observatory (INO) project site is outside the proposed buffer zone of the Mathikettan Shola National Park (MSNP), though the project area is not at all within MSNP and is well outside the proposed buffer zone. The area of MSNP is 12.82 sq km as notified in November 2008, and it is highly unlikely that such a small area can be home to "tigers and panthers" though elephants are known to occasionally stray into MSNP.

The letter states that the laboratory cavern will be 1.5 km-long and the equipment will be housed at 26-30 m. It adds that this "requires continuous blasting for years to make such a cavern, and 600,000 m^3 of rock will be removed". The numbers cited are incorrect—the cavern is 132 m long, 26 m wide and 32 m high, and will be accessed by a D-shaped tunnel 1.91 km long, 7.5 m wide and 5.5 m high. Total evacuation will be 230,000 m^3, not 600,000 m^3, of rock. This size of the tunnel is comparable to commonly found railway tunnels.

Will this excavation lead to a collapse of the hill itself causing a gap in the Western Ghats which may damage the whole ecosystem, as alleged in the letter? This claim is ridiculous as drilling tunnels even in shallow hills is routine, including in the Western Ghats. The hill under which the INO lab will be situated is about 1,300 m at its highest point and comprises mainly charnockite rock, considered the best tunneling medium in India. Tamil Nadu recently inaugurated the Kundah

letters

power project in the Nilgiris which bears close similarity to INO in terms of the size of the powerhouse cavern and tunnel. The tunnel will not run from the peak to base, but will be through a hillside like a railway or road tunnel. Hence, collapse of the hill is ruled out. We appreciate the concern of the letter that science cannot be done at the cost of the environment. At the same time, science projects should also not be opposed based on wrong assumptions or baseless fear-mongering.

D RAGUNANDAN, DINESH ABROL, K PAPPOOTTY, SABYASACHI CHATTERJEE, T V VENKATESWARAN
DELHI SCIENCE FORUM, JNU, KERALA SASTHRA SAHITHYA PARISHAD, ALL INDIA PEOPLES SCIENCE NETWORK, VIGYAN PRASAR

Go for local oil

This is regarding the cover story "Is it a mirage?" (1-15 July, 2018) which makes interesting reading. For a healthy heart, one should consume the oil that can be locally grown. Palm oil is a crop of the perhumid climate (of regions which are more humid than even Assam). Consuming such oil in an arid place like Delhi is not advisable. Likewise, olive oil is a crop of the high temperate regime and consumption of the same in peninsular

facebook.com/down2earthindia

Problem of plenty: milk farmers stuck between less demand, more supply

(posted on 18 July, 2018)

I think, demands are being met through imported dry milk powder, otherwise it is impossible to have surplus milk in India with 125 crore population.

ANITA POPLI

Comment reply: Not really. India is the world's largest milk producer, and that too, by a significant margin...Nobody drinks that much of milk. Additionally, Indians are mostly lactose intolerant.

NIRMALYA CHATTERJEE

twitter.com/down2earthindia

Mob slaughters 300 crocodiles after one kills a man in Indonesia

(tweeted on 16 July, 2018)

Much outrage over 'massacre' of 300 crocodiles in #Indonesia came from two quarters: animal rights activists and bigots. Turns out that the breeding farm where it all happened was also "harvesting" crocodiles for skins to feed the bag and shoes industry.

@ManshiAsher

The human race is a joke. Not many good people left.

@AlexPowell6

Where is #PETA?

@gkpgeo

India is not desirable.

Ubiquitous growing of industrial crops under a pricing scheme to ensure profitability to farmers even in areas and seasons of low productivity of the crop, as being sought in India for palm oil, carries several risks. These are: widening the inter-regional disparity in income of farmers growing such a crop; differences in profits of farmers supplying their produce to mills or factories at specified dates; non-exportability of surpluses, and; danger of import dumping of produce at a price lesser than what the consumer pays domestically in the absence of such imports. The solution lies in assessing the national require-ments of various edible oils and going in for specialised and economic production of specific annual oilseeds. Export capabilities, protection from import-dumping, profit security to farmers and fairness to customers should also be kept in mind.

S VENKATARAMAN
VIA EMAIL

Small steps

The article "Small is beautiful" (1-15 July, 2018) is synonymous with good urban planning. A "small" city is better managed while a big population, a big city or a big diversity poses myriad problems. Today's villages that can grow into tomorrow's towns are looked after by panchayats that seldom plan streets, drainage and sanitation. The toilets that have made recent entry are only to make a village open defecation-free with little thought given to planning. The panchayats, which receive lot of funds these days, should be mandated to enforce a minimum of planning. Many villages have grown into small townships but their growth has been haphazard in the absence of planning. The towns never conceive a sustainable growth plan taking into consideration factors like topography, available natural resources and climate. Furthermore, there needs to be a cap on further expansion. Only then will a large number of such small towns be better managed than big metros without any problems.

L R SHARMA
SUNDERNAGAR, HIMACHAL PRADESH

Easier on eyes

Thank you for increasing the font size of *Down To Earth*. This not only makes the content easy on our eyes, but also shows your commitment to the readers.

SREENIVASAN L
BENGALURU, KARNATAKA

Need for integrated approach

Apropos the cover story "Not a blip" (1-15 June, 2018) which was quite comprehensive and highlighted the present adverse weather conditions, particularly the dust storms in north India. As a resident of Delhi for the past 70 years, I can say this is not new. From 1950 to 1960, we witnessed a number of convective sandstorms and dust devils in western Rajasthan, Delhi and adjoining states during April-June till monsoon set in. The central government then planted trees like acacia in shelter belts and windbreak systems in some areas to arrest desertification. In 1970, a research team visited western Rajasthan after farmers lost their kharif crop due to a huge sandstorm. The Central Arid Zone Research Institute, in which I was a member, undertook several projects in Jodhpur to arrest desertification which were very effective.

The new age equipment for better weather forecasting in India began only in the run up to the Commonwealth Games in Delhi. Modern weather instruments like Doppler radars, Global Positioning System, supercomputers costing crores of rupees were installed. As such, forecasting dust storm is not made exclusively. Also, forecasting 100 per cent weather phenomena is just next to impossible, that too, in a tropical region like India where the atmosphere is always in a dynamic mode as compared to Western Hemisphere. Also a good database needs to be created with historical data from the modern instruments. This data needs to be applied properly to suit the models with suitable input parameters. We may have to use 8, 10 or 12 factors of climate to give us a near possible good prediction.

We do make Medium-Range Weather Forecasts with good accuracy for farmers. but long-range, short-range and nowcasting need improvement. Also, the present models should incorporate dust storm factor as a crucial input. Being a scientist, I strongly feel that an integrated approach involving the best scientists should be used to tackle the sandstorm- and dust storm-related problems. To tackle Western Disturbances, we can take the help of the Food and Agriculture Organization (FAO) and the World Meteorological Organization (WMO). During the 70s, we had locust swarm invasion of our agricultural lands coming from adjoining countries. With the help of FAO and WMO, the Indian Agricultural Research Institute mitigated and nearly eradicated the damage to crops by an efficient surveillance programme in which I was a participating scientist.

K KAILASA NATHAN
PRINCIPAL SCIENTIST,
INDIAN AGRICULTURAL RESEARCH INSTITUTE, NEW DELHI

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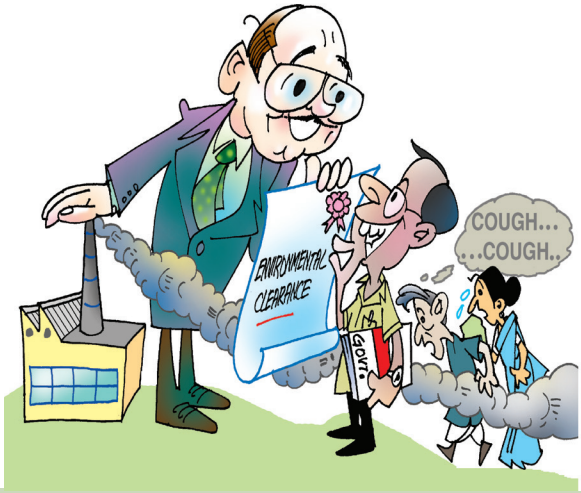

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LAST DATE FOR APPLYING
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OPEN FOR ALL
Functional Area Experts, Environment Consultants, NGOs, Regulatory Institutions (such as SPCB, State Environment Impact Assessment Authority), Students, Decision Makers and Industry Professionals

Environmental Impact Assessment (EIA) is an important tool to inform decision-makers, regulators and stakeholders, about the possible environmental, social and economic costs of the proposed project. To be effective, it requires the active involvement of all concerned stakeholders.

There is a genuine need to develop the capacity of all concerned stakeholders including regulators to screen and scope the EIA process, to conduct transparent public consultations and to evaluate the EIA reports. At the same time, there is a need among environmental managers and NGOs to review and interpret EIA report; and for consultants, institutions and academicians to conduct an effective EIA process.

Centre for Science and Environment recognises this need and has developed a hands-on five-day training programme aimed at giving exposure to the participants on EIA with specific reference to ***mining, power sector and infrastructure projects (road and highway).*** After the programme, the participants shall have an understanding of:

1. Legal requirements: Environmental Clearance Process, Circulars and Office Memorandums and other Laws and regulations applicable on projects
2. Filling of Form 1 and Formulation of ToR for development programme
3. Data Collection, Evaluation, Interpretation and Validation
4. Tools and thumb rules for environmental impact
5. Development of Environmental Management Plan (EMP) and Sector Specific best practices for Mitigation
6. Risk and Biodiversity Assessment
7. Socio-Economic Impact and Gender Inclusion
8. Review and Evaluation of EIA Report

Selection will be done on first come first basis

For registration: **Kindly email at: Arjunvir.chak@cseindia.org**

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CSE

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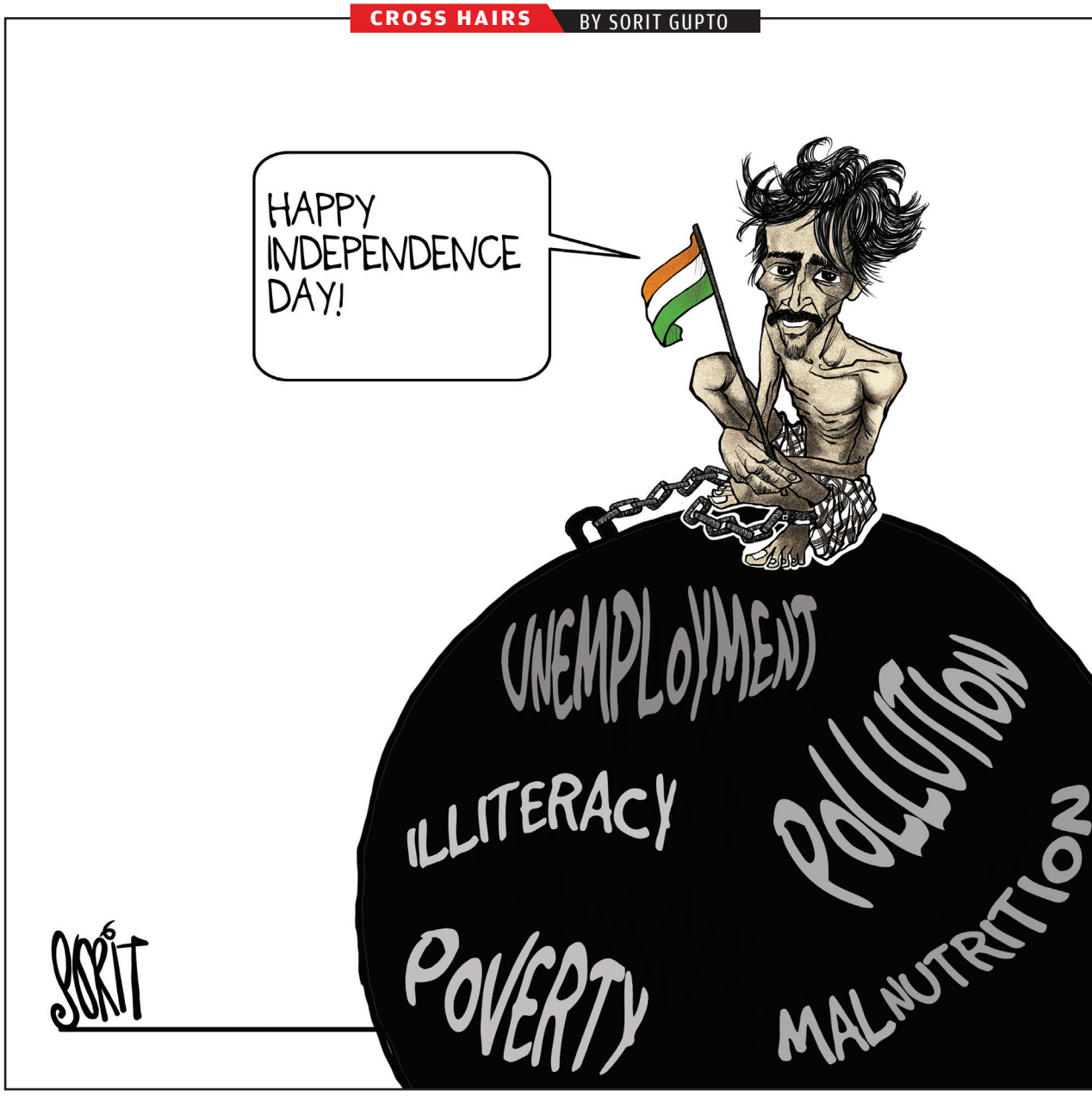
CROSS HAIRS BY SORIT GUPTO



For more dose of wit, check out www.downtoearth.org.in/cartoon

Gene-editing is GM: EU's top court

IN A severe blow to the biotech industry, Europe's top court has ruled that gene-edited crops should be subject to the same stringent rules as genetically modified crops. In this technology, mutation is induced in a crop by slicing its genome strands to remove undesirable traits. Since this does not involve insertion of foreign DNA, as in the case of GM crops, the biotech industry had hoped that gene-edited organisms would be exempted from laws that limit the planting and sale of GM food crops. Scientists studying the effects of gene editing say it can cause unexpected genetic damage which could lead to dangerous changes in some cells. ■

POINT

13%

is the drop in government spending on nutrition since 2014. This is when government spending on urban development has risen by almost 50% during the same period

Source: *State Finances: A Study of Budgets of 2017-18 and 2018-19* prepared by the Reserve Bank of India (RBI)

1,000 WORDS BY VIKAS CHOUDHARY

WATER WOES Sanjay Camp, a slum cluster near the diplomatic enclave of Chanakyapuri in New Delhi sees frenetic activity in the afternoon every day when a municipal tanker reaches the area. Most of these tankers source their water from borewells and tubewells across the capital state. People, including children, rush to collect water as the supply lasts only an hour. A NITI Aayog report warns that Delhi and 20 other cities, including Bengaluru and Hyderabad, will run out of groundwater by 2020 if corrective steps are not taken soon.

For more photos, check out @dtemagazine on Instagram

SBM is "lethargic"

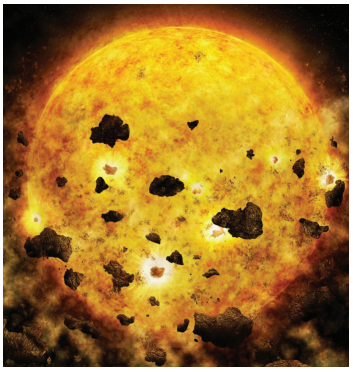
A RECENT Parliamentary Committee report has slammed the Centre's ambitious Swachh Bharat Mission-Gramin, saying its sanitation coverage seemed to be more on "paper" as the actual progress is "very lethargic". The 51st Standing Committee on Rural Development report dismissed the claim of the Union Ministry of Drinking Water and Sanitation of an 84 per cent sanitation coverage in the rural areas as on May 24, 2018. At a time when the Centre is working overtime to construct toilets across the country, the report notes that "even a village with 100 per cent household toilets cannot be declared open defecation-free till all the inhabitants start using them", and adds that the dream of a clean India is "still elusive". Much more needs to be done to obtain the "behavioural change" in rural populace to attain the real motive behind the programme, it says. There is unspent money to the tune of ₹14,088 crore that is lying with different states and union territories. ■

G20 warns of trade war

AS LATIN America readies to host the first G20 meeting in November amid rising trade tensions, global financial leaders who congregated at Buenos Aires recently for a buildup meeting have called for a stepped-up dialogue to counter potential shocks to world markets. French Finance Minister Bruno Le Maire said the current US trade policy of imposing unilateral tariffs is based on "law of the jungle". A trade war is now a reality, and the EU is not likely to consider negotiating a free trade deal with the US without America first withdrawing its tariffs on steel and aluminium, he said. US Treasury Secretary Steven Mnuchin defended the tariffs and urged the EU and China to open their markets to allow free competition. Though the G20 ministers agreed that international trade and investment are "important engines of growth", their communique falls short of concrete steps to prevent the spread of protectionism. However, it warns of risks to emerging market economies arising from the US Federal Reserve's raising of interest rates. Soon after the summit, US President Donald Trump said in a tweet that the US dollar "gets stronger and stronger with each passing day". The dollar plunged against the euro and the yen following the tweet. ■

IN FOCUS

Hungry star



For the first time, scientists may have caught a **star munching on a planet or mini-planets** near it.

Every few decades, the optical light of a **young star named RW Aur A** fades briefly before brightening again. In recent years, astronomers have observed the star **dimming more frequently, and for longer periods**.

The star, which is only 10 million years old, is located in the constellation Taurus **450 light years (1 light year = 9.5 trillion km) from Earth**. The Sun is nearly 0.14 billion km from the Earth.

A team of scientists from **NASA's Chandra X-ray Observatory** noticed a **collision of two infant planetary bodies**, including at least one object large enough to be a planet. The resulting planetary **debris fell into the star,** generating a thick veil of dust and gas that **temporarily obscured the star's light**.

The Observatory spotted a **30-fold increase in iron on the edge of the star**. Iron levels were not high in 2015 the last time the Chandra telescope looked at it. "We've **never seen any star** that's changed its iron abundance like that," says Hans Moritz Guenther, a research scientist at the Massachusetts Institute of Technology who led the study.

Guenther called the observation **"a lot stranger than we thought we'd be seeing"** and added that one of the **potential simple explanation is the star is eating a planet or mini-planets**. Experts say that is possible, but the **evidence is circumstantial**.

IN COURT

On July 17, the Supreme Court urged the government to pass an anti-lynching law and to stop the spread of internet rumours after a string of mob attacks, fuelled largely by social media, claimed several lives. "Horrendous acts of mobocracy cannot be permitted," noted Chief Justice Dipak Misra. The court blamed rising intolerance and circulation of "fake news" for the killings.

On July 18, the Supreme Court said there would be "no stopping of sealing or demolition" of unauthorised constructions in Delhi. It also directed that construction activity be stopped with immediate effect wherever any unauthorised construction is noticed.

"We do not know the concept of 'low potholes'. We want to know the standard laid down by the state government," the Bombay high court said on July 23 after the government informed it that the Mumbai-Goa national highway has "low" percentage of potholes.

Due to the apathy of the Central Pollution Control Board authorities, "green belts" are turning into "brown belts", the Hyderabad high court observed on July 19. It said it would also equip itself with "black belts" to deal with authorities for their failure in taking timely actions.

On July 23, the Kerala high court imposed a complete ban on plastic in Sabarimala to ensure an eco-friendly pilgrimage to the famous hill shrine of Lord Ayyappa. Only biodegradable products prescribed by the chief priest can be brought to the temple by pilgrims in their sacred bundle, the court said.

The Karnataka high court on July 17 regretted that the state machinery does not act with the same urgency for the children of labourers like it does for those of politicians. It was hearing a suo motu *habeas corpus* petition regarding a 17-year-old son of a labourer missing since April 2017. The court directed the state government to submit a report on cases of missing children registered during January 2015-June 2018.

SO FAR...

Total cases on environment and development tracked since January 1, 2018 till July 20, 2018

SUPREME COURT	HIGH COURTS	NATIONAL GREEN TRIBUNAL
133	119	120

Homosexual relationships do not lead to STDs like AIDS: SC

NOTING THAT Sexually Transmitted Diseases (STDs) cannot be blamed on homosexual relationships, the Supreme Court on July 17 said the cause of STDs is "not sexual intercourse but unprotected" sex. The court also listed prohibition on prostitution as one of the causes for the spread of STDs. "If you licence prostitution, you control it. If you shove it under the carpet, owing to some Victorian-era morality, it will only lead to health concerns," said a five-judge Constitution Bench, which reserved its verdict on pleas seeking decriminalisation of consensual gay sex. The Bench did not agree with the submissions saying that homosexual relations have led to the spread of AIDS.

Compiled by DTE-CSE Data Centre. For detailed verdicts, visit www.indiaenvironmentportal.org.in

Govts fight climate change as hurdles loom

IN A significant milestone, California met its target to reduce greenhouse gas emissions below the 1990 levels four years early, but its biggest source of pollution—vehicular emissions—is on the rise. What could contribute to this increase is the Trump administration's plan to weaken fuel economy standards and revoke the state's power to set its own stricter rules. A legal battle between the states and oil giants is underway. The transportation industry also remains the biggest hurdle to the picturesque Costa Rica, which plans to become the first carbon-neutral nation in the world by 2021, the 200th anniversary of its independence. Joining the bandwagon is Ireland that recently passed a bill to sell off its investments in fossil fuel companies "as soon as practicable". ■

EXTREME

3.2 million

new diabetes cases, or 14% of the total, were caused by air pollution globally in 2016, says a study published in *The Lancet Planetary Health*, raising hopes that reducing pollution may lead to a drop in diabetes cases in countries like India

1.7 million US veterans with no history of diabetes were monitored for 8.5 years

24% of people exposed to air pollution between 11.9 and 13.6 micrograms per cubic metre of air developed diabetes

21% of those exposed to air pollution between 5 and 10 micrograms—much less than the Environmental Protection Agency's safe level of 12 micrograms—developed diabetes

8.2 million healthy life years lost due to diabetes attributable to air pollution that year

Q & A

"Pads not a luxury item"

WHO: Anurag Chauhan, founder of Humans For Humanity, a self-funded organisation that works in urban slums and villages for menstrual awareness

WHAT: In July, the Goods and Services Tax (GST) Council exempted sanitary napkins from GST. They were taxed at 12 per cent previously that had attracted criticism.

WHY: GST exemption is a significant step towards making sanitary pads available to all economic classes. Just like condom is tax-free on the grounds that it is not a luxury product, sanitary pads are also not a luxury item. The next step should be to make the raw material for the pads GST-free. Pads are essential for personal hygiene, the lack of which leads to the death of a large number of Indian women. Some of them use ash, sand, leaves and dirty cloth. Disposable sanitary napkins are convenient and affordable for the less literate and less affluent sections as compared to solutions like menstrual cups. We make handmade sanitary pads from cotton cloth and distribute them in villages and urban slums for free. Lack of awareness and age-old taboos make some women think of menstruation as a disease. We are trying to address that.

Indigenous communities conserve land better: study

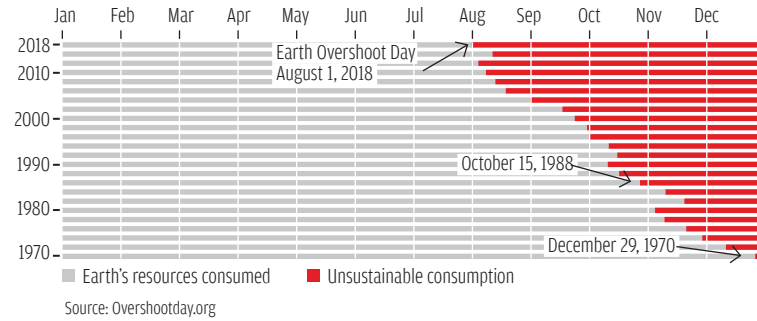
VIKAS CHOUDHARY / CSE

TODAY, INDIGENOUS people form just 5 per cent of the world's population, but control an incredible 40 per cent of all terrestrial protected land. Overall, they control 25 per cent of the Earth's surface—some 38 million sq km in 87 political regions, says a study published in *Nature Sustainability*. About two-thirds of indigenous lands are essentially natural, says the study, which provides strong evidence that recognising the land rights of indigenous peoples and partnering with them can greatly benefit conservation efforts. Authors of the study warn that such partnerships need to be forged soon as many of the indigenous lands are under huge pressure for development. ■

Food aid to buy vote?

AHEAD OF Zimbabwe's first presidential, parliamentary and local elections since Robert Mugabe's ouster, the ruling party was accused of using food aid as a political tool yet again. Nearly 2.5 million people are at the risk of hunger despite the government's promises of need-based distribution of food aid. Non-profit Zimbabwe Peace Project says many people were excluded from food aid because of their political affiliation, allegations echoed by the opposition leader Nelson Chamisa, 40. Chamisa, who belongs to the Movement for Democratic Change (MDC) Alliance, lost the presidential race to Zanu-PF's incumbent Emmerson Mnangagwa in a closely-fought election. ■

World eating up assets faster



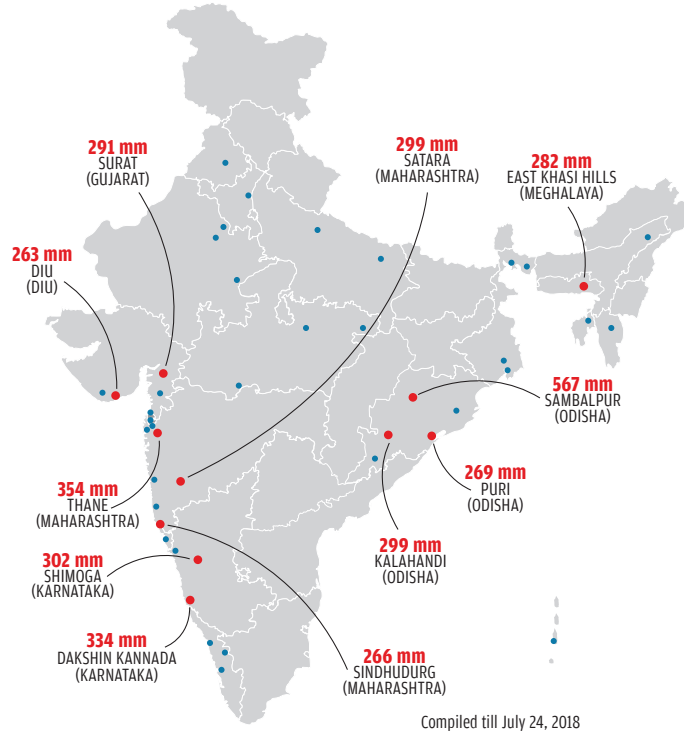
Source: Overshootday.org

HUMANS HAVE consumed a year's worth of carbon, food, water, fibre, land and wood in a record 212 days, or seven months. As a result, the Earth Overshoot Day—the annual date when we have caused a year's worth of environmental damage (when human consumption exceeds the nature's capacity to regenerate)—has advanced to August 1. This year's Earth Overshoot Day falls two days earlier than that of last year and is the earliest date ever recorded. The Global Footprints Network, which calculates the Earth Overshoot Day, says we would need the equivalent of 1.7 Earths to maintain our current appetite for resources. The overshoot has only moved forward since the 1970s. The ecological overspend manifests itself in biodiversity loss, deforestation, soil erosion among others. ■

FREAK STREAK/ MONSOON 2018

Takeaways from this year:

- There was a long stalling in the progress in June which disrupted the distribution severely
- Like last year, semi-arid and rain-scarce regions in Rajasthan have received above normal rains
- Deficit is the largest in east India—around Bihar and Jharkhand—which could be because only a few depressions formed over the Bay of Bengal this year
- The Arabian Sea arm of the monsoon has not been able to push rains beyond madhya Maharashtra. Even Marathwada, Vidarbha, Telangana and Madhya Pradesh got delayed first rains. Sowing had to be done twice in many parts
- States on the southwestern coast have received bountiful rainfall so far and rivers are flowing at dangerous levels
- Monsoon in the Northeast has been peculiar with heavy rain events coinciding with a large deficit



Compiled till July 24, 2018

● rainfall over 244 mm qualifies as extremely heavy rain ● rainfall over 124.5 mm in 24 hours qualifies as very heavy rain

VERBATIM

"Everybody knows the relationship the Prime Minister (Narendra Modi) has with certain business people. He waived off ₹2.5 lakh crore of 15-16 rich people, but didn't listen to the farmers"

— Congress President Rahul Gandhi during the no-confidence motion debate in the Lok Sabha

By Saira Aslam

Of funds and fallacy

Poor implementation of the District Mineral Foundation has excluded some of the worst mining-affected people, whom it was supposed to benefit

SRESTHA BANERJEE AND CHINMAYI SHALYA | NEW DELHI

Despite being a mining hub, the people of Jharkhand's Jharia coal mining area have not received any funds from Dhanbad's ₹935-crore sanctions under District Mineral Foundation

MORE THAN three years after the Centre rolled out the District Mineral Foundation (DMF)—an institution set up to benefit India's mining-affected people—life remains a daily struggle for Jhinki, a resident of Chhattisgarh's tribal Korba district. The irony is that despite having an impressive ₹674 crore, the DMF fund in Korba has done little to provide Jhinki and others in the district access to clean water, healthcare, nutrition, education or livelihood options. The plight of Jhinki is shared by many more people in India's mining areas, even though the country has collected over ₹19,400 crore under DMF.

After a decade of deliberations, DMF was instituted in March 2015 by amending the Mines and Minerals (Development and Regulation) Act

(1957) to "work for the interest and benefit of persons, and areas affected by mining-related operations". Today, poor implementation has shadowed its prospects, with many fearing it might just be reduced to another general government scheme. The mining districts, ironically, are the

PHOTOGRAPHS: CHINMAYI SHALYA / CSE

richest lands in the country inhabited by some of the most deprived people.

The law says a DMF trust has to be set up in all the mining districts of the country. The trust will receive payments from the mining companies operating in the district. "DMF technically can be a game changer for India's mining-affected people and areas. The fund, which is untied and non-lapsable, provides a defining opportunity to overturn the decades of injustice meted out to the millions living in India's mining districts. But DMF can only deliver if it is implemented in letter and spirit of the law," says Chandra Bhushan, deputy director general of New Delhi-based non-profit Centre for Science and Environment (CSE) (see 'A dig at the poor', *p58*). A recent CSE report titled "People First: District Mineral Foundation Status Report 2018" highlights how the scheme is faltering, despite its potential. It evaluates DMF's implementation in 12 top mining states and carries out in-depth reviews of the 13 top mining districts in Jharkhand, Rajasthan, Chhattisgarh, Madhya Pradesh and Odisha that account for over 72 per cent of the total DMF fund.

Flawed fundamentals

The DMF rules require the identification of the mining-affected people and areas to direct investments effectively. This not only includes the mining areas, but also areas where families have been displaced or rehabilitated due to mining, and villages that depend on the mining areas for economic needs.

In practice, none of the districts have identified the mining-affected people, who have the primary right to benefit from DMF. This has left out a big proportion of people. For example, in Jharkhand's Dhanbad district, which has old coal mines, the people of Jharia region, or those who have been relocated from there, have been completely left out from the districts ₹935 crore DMF sanctions.

Most states have also not developed a clear approach to identify mining-affected areas. Odisha has specified areas within 10 km radius from the mines as directly affected. Chhattisgarh has left it to the district administration to determine directly affected areas. As a result, the state's Korba district has taken a radius of three km from the mines as directly affected, and Raigarh has taken the radius as 10 km, both decided without proper mapping.

Several states have also identified indirectly affected areas very loosely, which experts say, is a way to divert DMF funds to non-mining areas. In Chhattisgarh, entire districts have been considered as indirectly affected. As a result, close to 46 per cent of the DMF sanctions are in Korba's urban areas for works such as multi-level parking lots, bus stops, and town convention centres, while 75 per cent of the directly affected areas are rural.

A similar situation can also be seen in Odisha. The CSE report says that Sundargarh, one of Odisha's top mining districts, is using ₹113 crore for providing piped water supply to municipalities that are not mining-affected. At the same time, only ₹7.5 crore has been sanctioned for the district's worst mining-affected Koida block.

People sidelined

One of the most important features of DMF is its bottom-up approach, which focuses on directly engaging the people in the decision-making. The DMF projects have to be planned in consultation with the gram sabhas, which should also review the works and identify the beneficiaries.

The CSE report says the administration in none of the 13 districts provided concrete evidence on the involvement of gram sabha in decision-making. The collector's office in Sundargarh, in a Right to Information (RTI) application, shows that the district had informed the people of the projects during a village meeting and got some of the residents to sign on the proposals. An RTI response from Korba states that the "required information (is) not available at the office". A district collector in Chhattisgarh, on the condition of

anonymity, admitted that the process is "not at all consultative". The CSE report also says that field visits reveal poor knowledge of DMF among the people in most areas.

While the affected people are being sidelined, bureaucrats and political leaders are increasingly overcrowding the DMF administration. The rules suggest the DMF trust will be run by a governing council and a managing committee. CSE's report, however, says that in almost all the 12 states, Members of Parliament (MPs) and Members of Legislative Assembly (MLAs), and not the gram sabha, are representing the people in the DMF trust. "Thus DMF decisions are driven by political interests," says Laxmi Chauhan, a human rights activist from Korba. The exclusion of the people is only increasing. In June this year, Telangana and Rajasthan amended their DMF rules to include MPs and MLAs, in the DMF governing council. The Telangana amendment has also transferred all the powers of the gram sabha to a single DMF committee, which now has only bureaucrats and political leaders.

While improving livelihood is a key concern in Chhattisgarh's Korba district, only 1.3 per cent sanctions have gone for livelihood generation

Despite having an alarming under-five mortality rate, Odisha's Sundargarh district has allocated a paltry ₹3 crore for women and child development, out of the district's ₹745 crore DMF funds. In contrast, the district has spent more than ₹300 crore on roads and bridges

Funds without a plan

One of the biggest problems with DMF today is that the funds are being spent without proper planning, leading to misplaced investments. Lack of people's participation has also left out some of the critical issues that DMF funds should have been spent on a priority basis. An example of this can be seen in Sundargarh. The area has an alarming under-five mortality rate (67 per 1,000 births), and stunted growth, yet a paltry ₹3 crore has been allocated for women and child development, out of the district's ₹745 crore sanctions. In contrast, the district has already spent more than ₹300 crore DMF funds on building roads and bridges. Child nutrition and development issues have also been neglected in Singrauli, West Singhbhum, Bhilwara despite these districts being under the national radar for poor nutrition indicators, says the CSE report.

The prospects of addressing child malnourishment have been further restricted by directions from several state governments. For example, Jharkahnd's West Singhbhum district is unable to make necessary investments in child nutrition because the state government in 2016 emphasised that DMFs should only focus on piped water supply and sanitation.

Need for a course correction

The first three years of DMF show worrying signs. "As we enter the fourth year, it is time to sort out the planning and implementation issues," says Bhushan. Aboobacker Siddique P, secretary, mines and geology department, Jharkhand, says that this will require strengthening of the institutions. "The deliberative capacity of gram sabhas should be improved," he adds. Officials from the Union Mines Ministry say that DMFs need to have dedicated staff and office space for coordination, planning and monitoring. S Vijay Kumar, a distinguished fellow of The Energy and Resources Institute (TERI), New Delhi, suggests need-based annual planning for DMFs. "The plans can be around the Sustainable Development Goals (SDGs), such as reducing child mortality or improving healthcare access within a timeframe. This will help achieve better outcomes through DMFs," he adds.

Finally, with such huge amounts of public fund, DMFs should be made more transparent by sharing everything in the public domain, a point that is even mentioned in the law. ■

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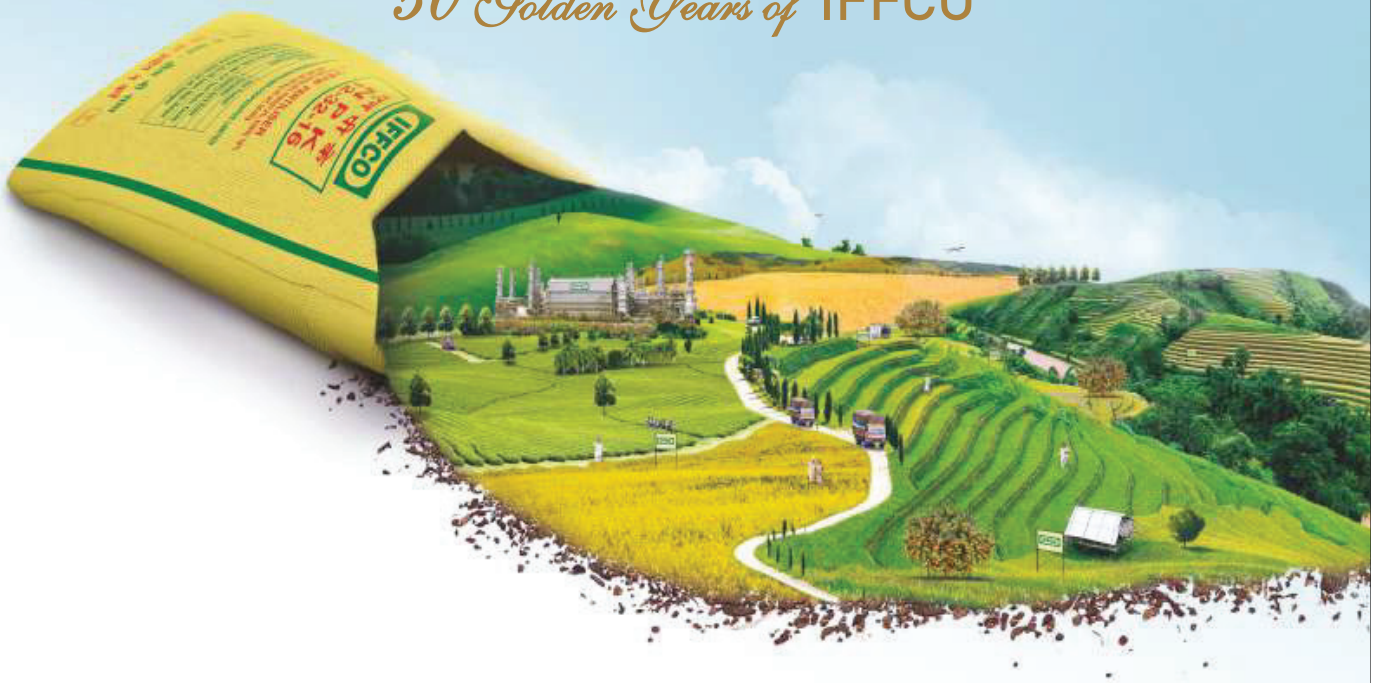

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Setting an example

NIDHI JAMWAL

A preliminary report by the Sikkim government suggests the green state is carbon-negative, but emissions are on the rise

NIDHI JAMWAL | GANGTOK

SIKKIM HAS become the first Indian state to assess its carbon footprint and estimate a trend for emissions. As part of its initiative "Sikkim Climate Inventory and Monitoring System" launched last year, all sectors in the Himalayan state, like transport, tourism, industry, roads, agriculture, are being studied to estimate carbon emissions from each of them. For instance, an increase in tourism means more vehicles, more hotel construction, road building to interior areas, which, in turn, means more carbon emissions. Under the project, being implemented by the forest department to create an inventory of greenhouse gas emissions, the total is then juxtaposed with the carbon sequestration by the state's forests to find out its carbon footprint.

"Sikkim is not only carbon-neutral, but carbon-negative, according to the preliminary report. This means our forests sequester more carbon than the state's total emissions," says Thomas Chandy, the state's principal secretary-cum-principal chief conservator of forests. The final report should be ready in six months after more data from the industry and tourism sectors, he adds.

As much as 82 per cent of the total area of Sikkim is under forests. Of this, nearly 31 per cent is protected forest while 7 per cent is dense forest. In carbon sequestration, trees, grasses and other plants absorb atmospheric carbon dioxide (CO_2) through photosynthesis and store it as carbon in biomass (trunks, branches, foliage and roots) and soil. The process helps offset CO_2 in the atmosphere from deforestation, forest fires and fossil fuel emissions. The Paris Agreement, an accord within the United Nations Framework Convention on Climate Change, recognised the role of forests as carbon sinks for mitigation of climate change under Article 5.

Sikkim has always done well in

'Carbon-negative states should be compensated'

Member of Parliament (Lok Sabha) **P D RAI**, who is also the convenor of Integrated Mountain Initiative for sustainable development in Himalayan hill states of India, talks to **NIDHI JAMWAL** on the effect of climate change in the state.

What are the impacts of climate change in Sikkim and the challenges thereof?
Our winters have become very dry and warm, and there is a perceptible shift in the way snowfall occurs. Earlier, the snowfall used to start in November, but now it begins only in January. Secondly, rains tend to be very heavy. The famous mandarin oranges, cardamom and ginger, that used to grow at lower altitudes, have started to climb higher. The major challenges are managing disasters, like cloudbursts and landslides, and water security.

Winter rainfall is on a decline in the state, which affects rabi crops. How is the state addressing it?
We need to store rainwater throughout the year and use it in winter. We can also recharge our aquifers, springs and streams for which the study of geology is most needed. We could also gauge the possibility of interconnecting our lakes, but that needs to be studied holistically. By doing all this, we can meet people's water needs for the next 30-40 years.

A recent government study suggests that Sikkim is carbon-negative. Should carbon-negative states need to be compensated and carbon-positive penalised?
Of course! For instance, Arunachal Pradesh should be hugely carbon-negative due to sparse population and major part of its forests being intact. But, Haryana has only three per cent forest cover. Our green cover is at 80 per cent and provides a lot of ecosystem services, such as freshwater, clean air and contribution to the Intended Nationally Determined Contributions. If we are doing that much more, the devolution of money or resources to the mountain states should be that much higher.

What demands will you put forth before the 15th Finance Commission?
The 15th Finance Commission is important to get the message across that the Centre now looks at mountains as a major ecosystem and wants to study it to understand its dynamics. We need adequate resources so that mountain states can introduce policies that help both mitigate climate change and adapt to it without having to plunder our natural resources.

sequestering carbon but this is the first time it has been found carbon-negative. In 2012, a state government report *Climate Change in Sikkim* called the carbon sequestration of forests in Sikkim "very significant in India". A study published the same year by the Indian Institute of Science (IISc), Bengaluru, put Sikkim's annual CO_2 emissions at 432.3 gigagram/Gg (1,000 Gg= 1,000,000 kg=1 teragram/Tg) per year, but estimated its carbon storage capacity to be 382.1 Gg per year—less than the carbon emissions, making it carbon-positive. The IISc study, which calculated state-wise carbon emissions and sequestration capacity, declared Arunachal Pradesh as India's major carbon sink, with a carbon storage capacity of 10 Tg per year against CO_2 emissions of 561.2 Gg per year.

Another study published in 2015 on carbon emissions in the northeast, found that of the total CO_2 emissions from energy sector in the region, the maximum share was from Assam (86 per cent), while Sikkim contributed only 1 per cent. Methane emissions from agriculture (paddy cultivation and livestock) and energy sector (fuelwood and LPG) were again found to be the highest in Assam and the lowest in Sikkim. In Sikkim, 55 per cent methane emissions were from livestock, followed by paddy (32 per cent), fuelwood (8 per cent) and LPG (5 per cent).

Chandy refused to share more details of the government study as the final report is not out yet, but cautioned that in last 10 year, carbon emissions in the state were on the rise (though they still seem to be below carbon-neutral values). He says: "Our study will help the state government prepare a roadmap and undertake projects for carbon neutrality." The state government will set up climate monitoring cells in each department, with the forest department as a nodal agency. These cells would find ways to make future projects carbon-neutral or negative. Lauding the initiative, P D Rai, Member of Parliament (Lok Sabha), Sikkim, said the study would conclude which way the state was headed, and hence, was crucial (see *"Carbon-negative states should be compensated"*). ■

(The story is being published as part of IHCAP-CMS Media Fellowship Programme)

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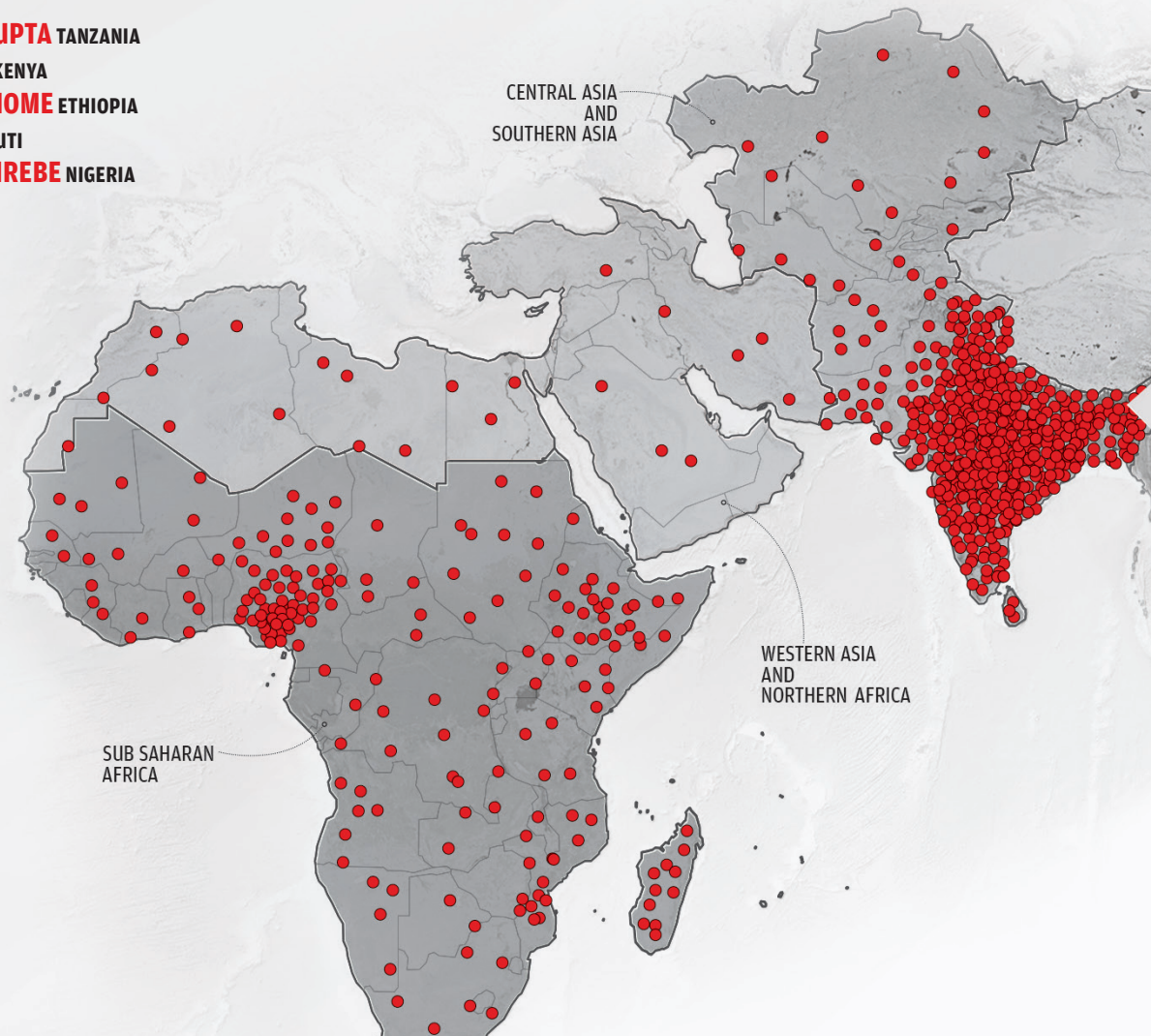
AFRICA

MELTING

Of the 10 persons defecating in the open globally, six are Indians. By 2019, six will be from African countries, and none from India, as the country is inching towards meeting total sanitation targets. Though some African countries have shown marginal improvement, they are likely to miss the Sustainable Development Goal on sanitation in 2030. But that is just the beginning of the continent's problems. Lack of safe sanitation will lead to more water-borne diseases resulting in higher healthcare expenses and productivity loss. Poverty-stricken African nations can ill afford to ignore this basic developmental right. What will it take for Africa to overcome the various hurdles to achieve total, safe and improved sanitation?

REPORTED BY:

SUSHMITA SENGUPTA TANZANIA
RASHMI VERMA KENYA
MEKONNEN TESHOME ETHIOPIA
ADEN NIMA DJIBOUTI
ABDALLAH EL-KUREBE NIGERIA



POTS

2019

2018

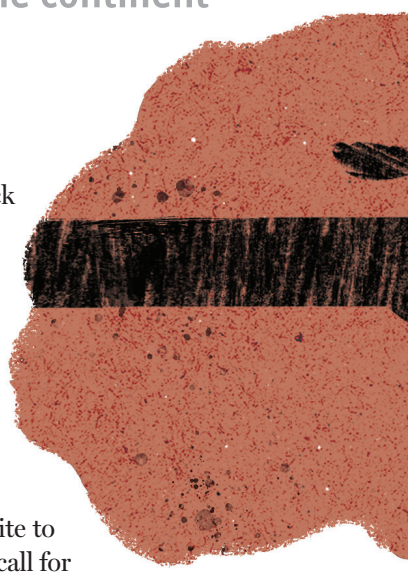
Note: Map is for visual representation only

COVER STORY

WILL AFRICA MEET ITS SANITATION TARGET?

More than 600 million Africans still lack access to safe sanitation. This will ultimately determine the well-being of the continent

KITCH BAWA



OF THE 1.2 billion inhabitants in Africa, more than 600 million lack access to safe sanitation. It is a serious problem as the lack of it affects the level of education, economic development and the overall health and well-being of people. The immediate casualties are children under five years. Besides, the discomfort associated with poor sanitation access and its impact on malnourishment is hard to imagine. Economically, lack of sanitation has a direct impact on the gross domestic product. The World Health Organization says millions of schooldays are lost due to poor sanitation in Africa and other parts of the developing and underdeveloped world.

Thus, there is an obligation for the world as well as for Africa to unite to tackle the bottlenecks in improved sanitation access. This is an urgent call for action, given that the continent has made the least progress towards achieving the Millennium Development Goal (MDG) on sanitation. For Africa to make any significant progress to achieve the Sustainable Development Goal (SDG) number 6 on sanitation by 2030, countries must adopt a new approach. Goal 6 states that access to safe water and sanitation and sound management of freshwater ecosystems are essential to human health, environmental sustainability and economic prosperity.

ON THE PATH OF COMMITMENT

African policymakers and political leadership have already established a strong platform for debating sanitation issues and arriving at proper solutions. In 2002, political leaders, government officials and non-state players met at AfricaSan, the first African conference on sanitation and hygiene, to debate on how to accelerate sanitation and hygiene access. After about six years, the second summit called AfricaSan 2, was hosted in Durban, South Africa, in February 2008, which was also the International Year of Sanitation. Ministers from 32 African countries in charge of sanitation and over 600 participants, including representatives from 42 African countries, attended the event. The main outcome was the AfricaSan eThekwini commitments. These were ministerial commitments that focused on improving the enabling environment for sanitation services and financing to accelerate progress. Among these was the one that aimed to "create separate budget lines for sanitation and hygiene in the countries and

to commit at least 0.5 per cent of GDP". These same commitments were later endorsed by the heads of state at a summit in Sharm El Sheikh in Egypt in 2008. The outcome of the process also led to the inclusion of sanitation as target 10 under goal number 7 of the Millennium Development Goals (MDGs): to reduce, by half, the number of people without access to basic sanitation and hygiene by 2015.

Since eThekwini, countries made significant improvements in the enabling environment for sanitation. This meant that many nations embarked upon development and improvement of the policy infrastructure and some carried out a process of institutional reengineering to position themselves for improving sanitation services delivery. At the end of the MDGs period, when the African Ministers' Council on Water, the World Bank and other stakeholders did an assessment on performance, there was a sharp improvement in the enabling environment. However, there was little improvement in the access to sanitation and Africa missed the MDGs related to it. This was due to the lack of financing and capacity for sanitation service delivery, absence of sector coordination, want of a clear lead for the sector and the lack of focus on vulnerable groups.

TARIQUE AZIZ / CSE

REAL CHALLENGES

As we have transitioned from the MDGs to the SDGs, the challenges have become more real, because the world targets open defecation and access to safely managed sanitation for all. Though the targets are ambitious, Africa has positioned itself to make progress by articulating the Ngor commitments on sanitation as a vehicle to help it achieve the SDGs. African governments made these commitments in 2015 during the AfricaSan 4 conference held in Dakar, Senegal. These cover key areas that the continent has to focus on to make progress. It has also developed a system to hold itself accountable to ensure it achieves the SDGs. Africa is the only continent that has put in place such a system to deal with sanitation. The next step is for national governments to take the lead to operationalise these commitments. The process is already afoot. AfricaSan has provided the platform for collective action. The question of how far Africa will go in meeting the target depends on how well the countries and other players work together and how much they are ready to commit.

(The writer is the Sanitation Project Manager, Africa Ministers' Council on Water, a Specialised Technical Committee for Water and Sanitation of the African Union)

COVER STORY

A toilet, many trails

African countries, rich or poor, are serious about having a toilet in their households. But they are facing a multitude of obstacles to get access to improved and safe sanitation

DJIBOUTI HAS Africa's worst sanitation coverage in rural areas; and reported a shocking 17 per cent increase in open defecation during 2000-2015. One in every four persons goes out to defecate; in rural areas, three in four defecate in the open.

But nobody talks about it. The decade-long spell of drought overwhelms discussions on sanitation. For the world outside, the tiny country is talked about for an entirely different reason—3.3 per cent of the country's population are refugees, from the Yemen war. So the discussions mostly hover around the humanitarian crisis involving migration.

However, the world is discovering the impact of the lack of access to safe sanitation on the humanitarian crisis brewing in the country. Djibouti is facing a health emergency as water-

borne diseases have afflicted the entire population, especially children and women. Most of the waterbodies are now contaminated with faecal remains. And this poses a double whammy for the country which is grappling with severe drought for nearly a decade.

As such, Djibouti gets just 200 mm rainfall a year. Only 0.01 per cent of its land is arable. Most of the country's water sources are either dry or hardly carry any water. According to the United Nations International Children's Emergency Fund (UNICEF), the limited water supply and stretched services have left nearly 100,000 drought-affected people, living along migration routes, with no access to safe water, and obviously sanitation. The constant flow of refugees in an already safe sanitation-deficit country has made the situation unmanageable.

Djibouti's capital—also called Djibouti—is home to half of the country's population. It is only here that one can see the presence of household toilets. But a booming population is making the situation worse. With three-fourths of Djibouti's population living below the poverty line and more than 50 per cent of rural population food insecure, urban settlements like the capital city are witnessing a deluge of migration of rural inhabitants due to drought. This has increased the demand for basic necessities like water and sanitation. For example, Djibouti city dwellers may have the luxury of having toilets in the houses, but access to sanitation services is still underdeveloped, particularly in the densely-populated southern suburb of Balbala.

Urban areas are finding it difficult to manage wastewater. "Until March 2014, wastewater collected in Djibouti was discharged into the sea without treatment. A sewage treatment plant was commissioned with funding from the European Union (EU)," says Radwan Abdillahi Bahdon, Djibouti's Director of Sanitation. But such initiatives are a drop in the ocean.

The government has been trying to provide financial as well as technical assistance to residents for building mostly primitive and unsafe drop hole toilets. But it is unable to cope with the demand. Djibouti shares a long porous border with Somalia and Ethiopia. There is constant movement of both people and livestock, especially during the lean season (June-September) when nomadic communities often migrate from neighbouring countries to Djibouti in search of pastures for their livestock. Such displaced populations add to the pressure on the already precarious livelihoods in these areas and this is further aggravating food insecurity, as well as overburdening the fragile service delivery systems for nutrition, water and sanitation, health, child protection and education.

Moreover, the rise of acute watery diarrhoea and cholera outbreaks in neighbouring countries has exposed Djibouti to a high risk of epidemics in view of its fragile health systems—low rate of access to safe water and improved sanitation and limited knowledge of key hygiene practices. It is expected the country may well miss its Sustainable Development Goal targets on safe sanitation practices.

But other African countries, with relative advantages, are also finding it difficult to meet this basic target.

NIMA ADEN

Djibouti is facing a health emergency as water-borne diseases have afflicted almost the entire population. Most waterbodies are contaminated with faecal remains

COVER STORY

NEW BEGINNINGS

Take Nigeria for instance, a relatively prosperous country. Unlike Djibouti, Nigeria has reduced open defecation by 6 per cent during 2000-15. Still about 24 per cent of its population defecates in the open, making Nigeria third-worst in the world in terms of open defecation, after India and China. Notwithstanding this progress, the country typifies Africa's big challenge: shifting from basic toilets to improved sanitation services. Only 36 per cent of Nigeria's population has access to improved sanitation.

For the hard-earned economic progress, this is bad news. The World Bank estimates that poor sanitation costs Nigeria US $3 billion annually, or 1.3 per cent of the country's GDP. The country already attributes the annual deaths of 124,000 children under the age of five to outbreaks of diseases like diarrhoea and cholera linked to lack of sanitation. For 2018, Nigeria has budgeted US $2.7 million for health emergencies and contagious diseases. It also budgeted US $5.5 million for expansion of water, sanitation and hygiene facilities. An Abuja-based independent environment expert, Ayuba Danasabe Umar, says, "Adequate public toilet facilities would rid the country of faecal contaminants that cause enteric diseases and gastroenteritis."

In 2014, Nigeria took the first steps to be open defecation-free by 2025. But with a change in strategy: involving communities to ensure quality. The National Council on Water Resources (NCWR) partnered with UNICEF to roll out the strategy. Federal ministries—health, water resources, environment, education, housing and urban development and women affairs—converged their activities to attain the target. Alhaji Sidi Abbas, executive director of Sokoto State Rural Water Supply and Sanitation Agency (RUWASSA), says initially Tangaza local government area of Sokoto state was selected for the project. Its success through community-led total sanitation (CLTS) campaigns has prompted the government to expand the strategy to 23 areas in the state.

Open defecation has reduced from 80 per cent in 2000 to 27 per cent in 2015 in Ethiopia, but most of the toilets are still unsanitary

MEKONNEN TESHOME

CELEBRATED WITH CAUTION

As they say, there is no one solution to a crisis that criss-crosses a continent. Ethiopia is an example of winning with a warning. It recorded the highest global reduction rate in open defecation—based on proportion to population. Haimanot Assefa, a rural water supply specialist with UNICEF-Ethiopia, says the country has shown a 53 per cent reduction in open defecation: from 80 per cent in 2000 to 27 per cent in 2015.

Ethiopia is an example of scaling up CLTS along with a much-needed change in strategy—making it a part of the health policy. The country has been successfully implementing its unique Health Extension Programme (HEP) under which water, health and sanitation issues are approached as inter-related concerns. The impressive reduction in open defecation coincided with a similar increase in water supply access coverage, which increased from 14 per cent in 2000 to 82 per cent in 2016 in rural areas.

But this does not mean improved quality of sanitation. The National Hygiene and

Environmental Health Strategy confirms that improved toilet coverage in the last 25 years is only 28 per cent. Citing a recent study, Assefa, says that over 90 per cent of urban residents use an on-site sanitation facility, of which nearly 80 per cent are dry pit latrines. He says with less than 3 per cent people having access to a sewer connection, wastewater is continuing to contaminate waterbodies.

Ayantu Taffa, a resident of Kebelein of the Oromia Regional State, says, "Our family has a pit toilet access and a dug well. However, there is no way we can ensure the safety of water." She adds that her children often suffer from diarrhoea and cannot attend school due to water-borne diseases. Ethiopia is the worst trachoma affected country in the world, with women as well as children aged 1-9 at the highest risk of infection, according to Abireham Misganaw, a public health expert and a member of the Waste Management Team of the Ethiopian Ministry of Health. He cites a national survey stating that the prevalence of active trachoma for children in the age group 1-9 is 40 per cent because of lack of improved access to water and sanitation.

The Ethiopian National Hygiene and Environmental Health Strategy says: "Poor sanitation costs Ethiopia 2.1 per cent of the national GDP. Yet, eliminating the bad practice would require only 6 million improved latrines to be built and used." Dagnew Tadesse, director with the Hygiene and Environmental Health (HEH), Directorate of the Ministry of Health, says, "Ethiopia should now turn its face to ensuring improved quality sanitation and water supply schemes."

SUSHMITA SENGUPTA / CSE

Such makeshift open pit latrines, without clean water supply, are common in Tanzania. Since they are often shared by several households in a locality, the women suffer from urinary tract diseases

TEST OF IMPROVED SANITATION

In Tanzania too people are not reaping the health gains expected through improved levels of sanitation. The case of Mashabani, a 34-year-old resident of Magodani village in Temeke district of Dar es Salaam region, is a testament to this challenge. Mashabani thought that owning a toilet would rid her family of water-borne diseases. "But I and my six children continue to suffer. I spend US $15 every month from our total earning of US $90 on treating water-borne diseases," she says. She has an open pit toilet. For close to three months, it remains flooded due to rains. "My waste gets mixed up with other water sources and the result is that we consume contaminated water."

Abdara Juma, the chairperson of the village, says, "We have toilets, but they are of bad quality." Since August 2015, the country reported 31,291 cholera cases with a death toll of 522. Given the low income of Tanzanians, residents can only afford such basic toilets that costs up to US $44. "Since most residents share toilets, without clean water supply, the women suffer from urinary tract diseases," says Muamma Muskin, a mother of five children, who herself suffers from an urinary tract infection.

However, Anyitike Mwakitalima, coordinator of the National Sanitation Campaign, a non-profit, says sanitation is not the primary reason for cholera outbreaks; the Ministry of Water has failed to supply clean water to all the regions.

Ali Nyanga, who is with the Ministry of Health Community Development, Gender, Elderly and Children, argues that water supply and sanitation cannot be addressed in a standalone manner, both needs to be safe and sustainable for a healthy country.

Tanzania aims to provide a basic toilet to every household by 2021, says Rowland Titus, who works with UNICEF-Tanzania. In December, 2017 Vice President Samia Suluhu launched a campaign called "*Nyumbu Ni Choo*" (a house

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JERY OTIENO

Of the 11,641 villages in Kenya, only 3,131 have so far been certified open-defecation free

without a toilet is not a house at all). But both UNICEF and the World Bank, who are working with the government on sanitation issues, think it is an ambitious goal. At the current pace of work, the target can be met only by 2027, which is just three years away from achieving the deadline of the Sustainable Development Goal. The Joint Monitoring Programme (JMP) of UNICEF and WHO found in 2015 that around 11.26 per cent of the population practiced open defecation, which was a 2 per cent increase during the 15 years period.

But Anyitike says only 5.8 per cent of the country defecates in the open. He explains that in the first phase of sanitation programme through CLTS in 2012, the open defecation rate was 20.5 per cent. But that does not mean improved sanitation facilities, explains Rwegoshora Rwekaza Makaka, water supply and sanitation specialist with the World Bank group.

COST MATTERS

Improved sanitation comes with a high price tag. Many of Africa's relatively prosperous countries find it unaffordable. Take Kenya for example, which aims 100 per cent coverage of safe water and basic sanitation services by 2030. For this, it annually requires US $12.9 billion for water supply, US $4.8 billion for sewerage, US $601 million for basic sanitation and 57 million for basic hygiene. "But, the government budget available for sanitation is only 6.5 per cent," says Vincent Ouma, of the Kenya Water and Sanitation Civil Societies Network (KEWASNET), a national network of water civil society organisations in Kenya.

Technology options are also limited. According to the Kenya Demographic and Health Survey (2014), over 60 per cent of rural households rely on non-improved sanitation facilities. Different agencies work to promote viable toilet designs. "Most of the toilets are dry pit toilets. The efficacy of such toilets lies in its reusable nature. But due to the lack of acceptance among people for faecal matter to be used as manure, the user usually shuts it down and builds a new toilet or calls the companies to clean it up. The management of faecal matter is our top concern," says Janet Muse, head, WASH Hub, a dedicated cell of Ministry of Health, Kenya. "The EcoSan Promotion Project is one such pilot project which was implemented in the areas of Nyanza, Western and North Eastern provinces. Despite health, sanitation and economic benefits, this toilets model had very low acceptance among rural households," adds Janet.

Plan Kenya introduced CLTS in Kenya in May 2007. The idea had instant acceptance. In 2010, Ministry of Public Health and Sanitation embarked a pilot project in the six districts of Nyanza and Western Kenya. Later, the ministry adopted CLTS as a key strategy at national level. This led to the launch of the Open Defecation-Free (ODF) Rural Kenya Campaign in May 2011.

But, meanwhile, it lost the tempo. A study published in *East African Medical Journal* on assessment of CLTS in rural areas, concluded that it failed to result in open defecation free status as expected. The study cited inadequate monitoring of the process, inadequate funds and conflicting work demands of government officials as the reasons. In 2014, there were only 3,131 certified ODF villages of the 11,641 villages. "Counties need constant support to develop legislations, policies and effectively utilise available financial resources and channelise more resources," says Kimanthi Kyengo, director, Ministry of Water and Irrigation.

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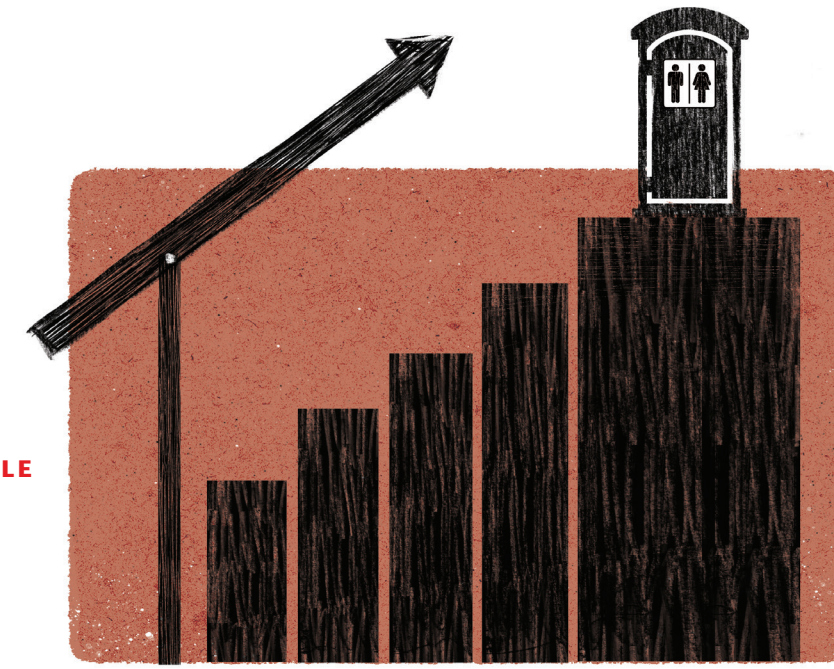
COVER STORY

SANITATION SHOULD BE PART OF DEVELOPMENT

Most East African nations either forget about this important issue or accord it the bottom position in their growth agenda

OLUTAYO BANKOLE-BOLAWOLE



TARIQUE AZIZ / CSE

AFRICAN WOMEN and children are bearing the brunt of the continent's sluggish pace in sanitation, with health, nutrition, education, gender equality and poverty reduction being at stake. The situation is dismal in Sub-Saharan Africa where countries have not attained safely managed sanitation services and are still at the basic services level, according to the UNICEF. The scenario is no better in East Africa where over half the people in informal settlements live in unsanitary conditions. At present, in this region there is no country with more than 68 per cent access to adequate sanitation. Rwanda appears to be the only one to achieve this percentage and above. Despite commitments by several governments and the United Nations' recognition of sanitation as a basic human right, it still remains neglected. At the current rate of progress, universal access to safely-managed sanitation, the aim of the Sustainable Development Goals (SDGS), won't be achieved until 2107—77 years behind schedule.

The knock-on effects of poor sanitation are considerable. According to a study done by Lixil Corporation, which specialises in water and housing products, global research firm Oxford Economics and the UK-based WaterAid, lack of proper sanitation costs the global economy a staggering US $222.9 billion annually. Of this, mortality rate accounts for $122.8 billion, medical treatment $56.6 billion, lost productivity $16.5 billion and the time spent on finding a toilet $27 billion. Africa accounted for about $19.3 billion of this total cost after the launch of the SDGS, of which about 75 per cent came from sanitation-related deaths. In many countries, the economic cost of poor sanitation and hygiene amounts for more than 5 per cent of their gross domestic product.

FACTORS PLAYING SPOILSPORT

There are a number of factors affecting the attainment of safely managed sanitation services in East Africa. The main problem is that most countries focus on water provision, but never link it to sanitation. Both must be addressed together to improve people's access to toilets. One cannot also rule out climate change, which leads to either prolonged droughts or floods. As a result of these two extreme weather events, progress achieved by the countries in sanitation is adversely affected. Resources for building sustainable sanitation infrastructure is diverted to deal with emergency and humanitarian response.

At present, most East African countries are grappling with how to prioritise sanitation among other development agendas. Most of the times, sanitation is either forgotten or accorded the bottom position in the priority list. For example, many middle-income countries give priority to infrastructure to attract investment. There are cost-effective models for managing sustainable sanitation services that could be piloted across East Africa, but knowledge and commitment to test these solutions are often not prioritised.

THE MAIN PROBLEM IS THAT MOST AFRICAN COUNTRIES FOCUS ON WATER PROVISION, BUT NEVER LINK IT WITH SANITATION. BOTH MUST BE ADDRESSED TOGETHER TO IMPROVE ACCESS TO TOILETS

Lack of resources is another critical factor. The capacities to provide for innovative solutions that work in urban, rural and unplanned settlements are not readily available in most countries or are often limited. Most countries invest in huge sewerage systems that do not always include the poor and those living in unplanned settlements.

The priorities of many international non-profits and development partners also impact sanitation progress. These stakeholders have competing priorities within a specific country, spread themselves thinly across countries and often do not employ their strengths to ensure that their resources make the necessary impacts. As a result, one sees only a few pockets of projects lying far-flung in each country with no clear sustainability plan in place. Development partners also divert funds for sustainable development work, thus leaving fewer resources for sanitation.

Urbanisation is a key factor impacting the attainment of good and sustainable sanitation services in East Africa. The planned urban settlements are busting at the seams and putting pressure on the existing sanitation infrastructure and the sewerage system constructed long ago. Apart from these, migration to urban areas put further strain on the existing infrastructure in unplanned settlements.

TOWARDS A BETTER FUTURE

Many ongoing interventions hold hope for East Africa. Lately, there has been an increased commitment by governments in this region to ensure sanitation catches up with the provision of safe water. More budgetary allocations are being made to cater to WASH (water, sanitation and hygiene) services in a targeted way. There has been a renewed effort to cater to people living with disabilities, women and children in programme designs on toilets, latrines and behaviour changes. Several innovations on faecal sludge management are being piloted and rolled out across countries with WaterAid's presence in the region. Some of these innovations have led to a scaling up of some of the pilots in several districts of Rwanda, Ethiopia and Tanzania.

To meet SDG 6 target of clean water and sanitation, there has to be a holistic approach to ensure integrated development across all sectors. The district-wide approach of WaterAid has been successful. It ensures that all development partners in African countries pull their resources together to attain the SDG goal. Other steps are building collaborations with key regional economic commissions and agencies to ensure there is a clear focus on sanitation. Some of these include AfricaSan, one of the path-breaking initiatives on sanitation and the Rural Water Supply and Sanitation Initiative, an Africa-wide programme hosted by the African Development Bank. The East Africa Community's health department is also prioritising the integration of WASH and health for improving sanitation by sharing lessons and innovations.

(The writer is regional director, East Africa, WaterAid)

COVER STORY

Overwhelmed by despair

The state of sanitation is deteriorating in Sub-Saharan Africa, with countries switching from open defecation to unsafe toilets

UNDER THE Sustainable Development Goals, set by the UN, countries must provide adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations by 2030. But this is a gargantuan task given that today, some 2.4 billion people, or one in three across the world, are struggling to stay well, keep their children alive and work their way to a better future because they have nowhere safe to go to relieve themselves; some 892 million of them defecate in the open for want of a toilet. In fact, some estimates show that more people today have mobile phones than access to toilets.

The number of people practising open defecation has increased in Sub-Saharan Africa, and the region now accounts for a greater share of the global total as compared to 1990, says the Joint Monitoring Programme report by WHO and UNICEF

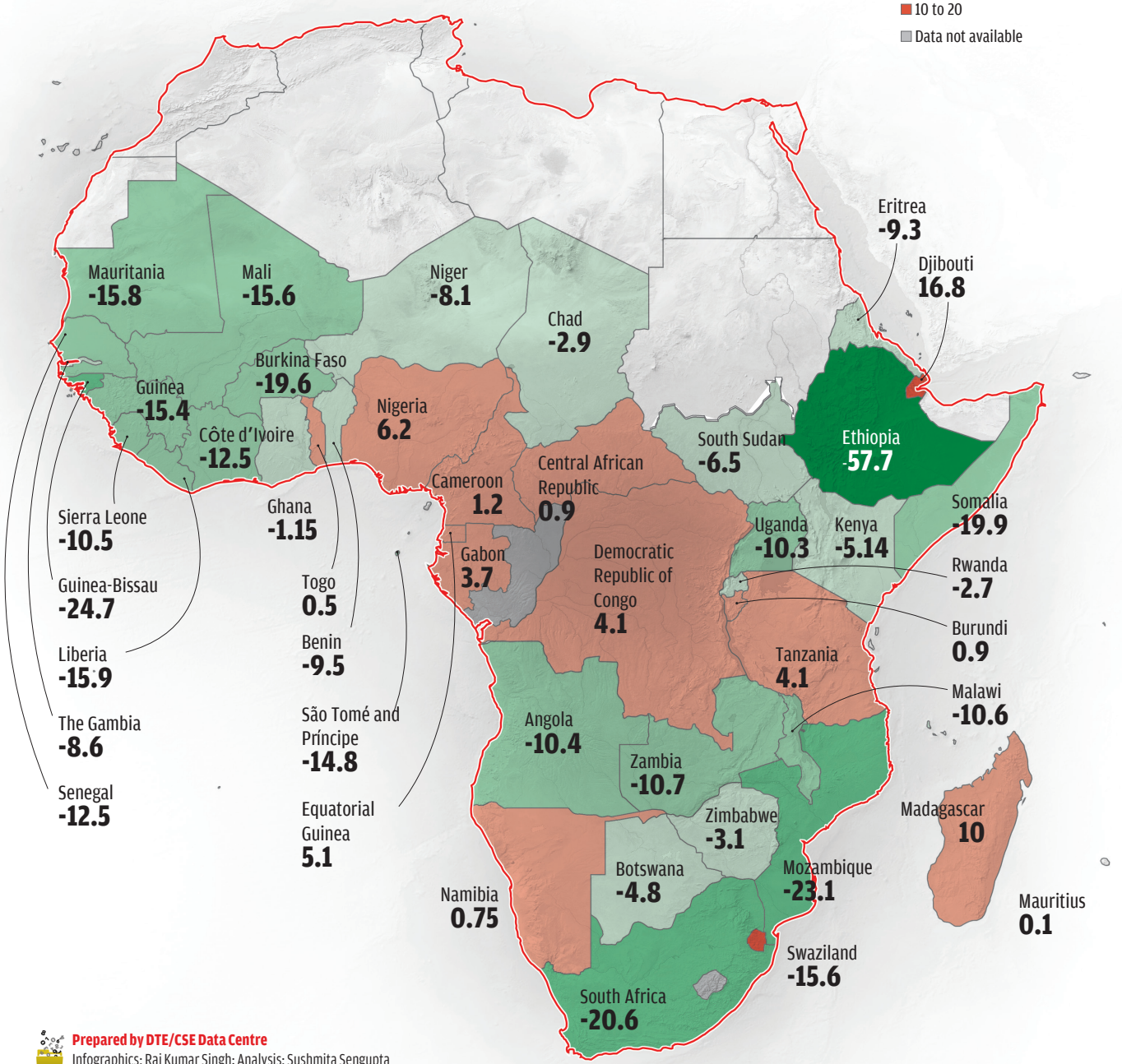
The problem is particularly acute in Sub-Saharan Africa (see 'The slow walk to...' *p37*). The region, as the name suggests, lies south of the Sahara desert and has been an area of concern for global communities as its countries and island states are among the poorest and least developed in the world; half of the region's population live on less than a dollar a day. Estimates show that the region is home to about one-fourth of those defecating in the open worldwide. On an average, these people spend some 2.5 days worth of time in a year trying to find a private location to defecate, according to a 2012 assessment of 18 countries by the World Bank under its Water and Sanitation Program (WSP) (see 'Cost of finding...' on *p38*). This results in losses to the tune of US $500 million a year to these countries, which account for half of the population in the continent. Women shoulder a huge proportion of this cost as they spend additional time finding a safe place for urination or accompanying young children or sick or elderly relatives to relieve themselves.

In December last year, international non-profit WaterAid released a report "Out of Order—the state of world's toilets" that says the 10 worst countries in terms of access to sanitation are all situated in Sub-Saharan Africa. The region had in fact showed a sluggish progress towards meeting the UN's Millennium Development Goals (MDG), under which countries had to halve the proportion of people without basic sanitation by 2015. According to the World Health Organization (WHO), less than 17 per cent people in Sub-Saharan Africa gained access to sanitation during the MDG period as compared to 50 per cent in Western Asia and 41 per cent in Northern Africa.

What's worse, the state of sanitation has deteriorated to worrying levels in countries like Djibouti. The Joint Monitoring Programme (JMP) report, prepared in 2017 by WHO and UNICEF, notes that due to a combination of population growth and slow progress, the number of people practising open defecation has actually increased in sub-Saharan Africa, and the region now accounts for a greater share of the global total as compared to 1990. The progress of sanitation and hygiene coverage in rural areas is worse than in urban areas. At current rates of reduction, open defecation will not be eliminated among the poorest in rural areas by

The slow walk to total and safe sanitation

Barring Ethiopia, most countries have made marginal progress since 2000



Prepared by DTE/CSE Data Centre
Infographics: Raj Kumar Singh; Analysis: Sushmita Sengupta
Data source: Joint Monitoring Programme Report, 2017, WHO and UNICEF
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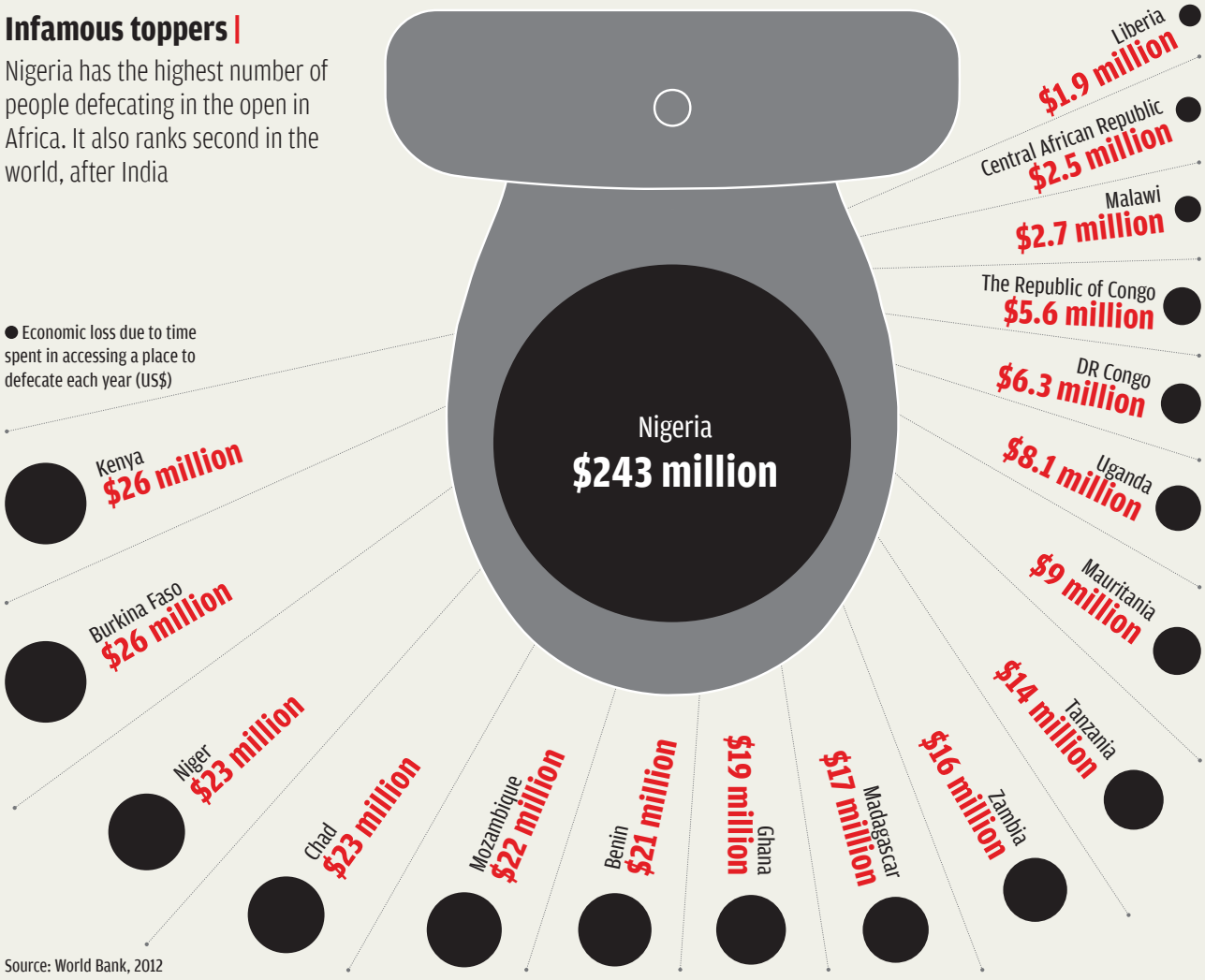
Cost of finding a place to defecate

Each African spends almost 2.5 days each year to locate a place to defecate. This figure does not include women trying to find a place to urinate or accompanying a child or senior citizens

Infamous toppers |

Nigeria has the highest number of people defecating in the open in Africa. It also ranks second in the world, after India



Source: World Bank, 2012

2030, the report warns.

What's bizarre is most countries that have witnessed improvement in reducing open defecation have done so by providing unimproved means of sanitation. JMP data shows that at the beginning of the MDG period, some 32 per cent people in Sub-Saharan Africa defecated in the open. The figure fell by 9 per cent by 2015. During these 15 years, the figure for those practising unimproved sanitation increased from 29 to 31 per cent. Going by WHO, unimproved sanitation facilities do not help hygienically—as excreta from is not separated from human contact—and, hence, pose health risks. In Sub-Saharan Africa, most people depend on unimproved facilities that belong to the apartheid era—uncovered pit latrines, buckets and even plastic bags.

UNDERBELLY OF SANITATION

On July 4, while visiting his aunt's house in South Africa's Limpopo province, three-year-old Omari Monono went to relieve himself in the pit toilet built metres away from the house. Instead, he slipped and drowned in the faeces-filled pit and died. A few months ago in March, five-year-old Lumka Mkhethwa died after falling into a pit toilet at the Luna Primary

Productivity loss | Cost of children missing school due to diseases each year; this doesn't include days lost by adults

Nigeria	$13 million
Kenya	$2.7 million
Burkina Faso	$0.8 million
Niger	$0.6 million
Chad	$0.9 million
Mozambique	$1.1 million
Benin	$0.7 million
Ghana	$1.5 million
Madagascar	$0.3 million
Zambia	$1 million
Tanzania	$1.6 million
Mauritania	$0.4 million
Uganda	$1.1 million
The Democratic Republic of Congo	$1.1 million
The Republic of Congo	$1.1 million
Malawi	$0.3 million
Central African Republic	$153
Liberia	$80,000

Health costs | Amount of money lost each year due to expenses incurred due to treating water-borne diseases

Nigeria	$191 million
Kenya	$51 million
Burkina Faso	$8.3 million
Niger	$9.2 million
Chad	$4.3 million
Mozambique	$22 million
Benin	$3.1 million
Ghana	$54 million
Madagascar	$9 million
Zambia	$10.6 million
Tanzania	$19 million
Mauritania	$5.7 million
Uganda	$21 million
The Democratic Republic of Congo	$17 million
The Republic of Congo	$4.5 million
Malawi	$12 million
Central African Republic	$2.3 million
Liberia	$7.1 million

School in South Africa's Eastern Cape province. The pit latrine has since been closed. A similar incident occurred in Limpopo in 2014, resulting in the death of Michael Komape, also aged five.

Pit toilet is the simplest form of dry toilet in which faeces are collected in a hole made on a concrete floor. The toilet seat is installed just above the hole, which remains covered with a lid when the toilet is not in use to prevent stench and contamination. Most designs do not require the use of water and are hence considered suitable for water-scarce regions, like those in Sub-Saharan Africa. But most pit toilets in the region are nothing more than just pits on the ground. The ones that have seats are made from cheap metals, they are shoddily built and remain uncovered.

The pit toilet that Michael went to at the Mahlodumela Primary School had an iron sheet that served as the seat and a white plastic lid. But the seat was so corroded that it collapsed when Michael sat on it. He fell in along with the plastic lid. His parents are now fighting a lawsuit against the education department demanding justice. All this is when access to proper sanitation is a basic human right enshrined in South Africa's constitution and the country has reduced the prevalence of open

defecation by 20.6 per cent during the MDG period.

In Ethiopia, seven in every 10 people use toilets. But the country has made the progress largely by investing in shared toilets. So has been the strategy of Tanzania, where more and more people are defecating in the open—the country's open defecation rate increased from 11.6 per cent to 15.7 per cent between 2000 and 2015. Experts believe the increase is due to the failure of poor toilet infrastructure like, the pit hole. Hadija Menato, a 45-year-old fruit vendor from Kizeitoheonywan village in Dar es Salaam shares the toilet with two households in her locality. The toilet is nothing but an open-pit latrine without a roof and door. While the toilet usually remains soiled and clogged, the condition worsens during rainy season. The rainwater mixed with sewage floods the entire village. "We not only suffer from intestinal diseases but fungus attacks on legs as we have to wade through faecal-laced water every day. In dry months, clean water supply becomes scarce and most of us suffer from diseases like jaundice and diarrhoea," says Menato.

In Tanzania, where the prevalence of open defecation has increased over the past 15 years and only 17.2 per cent people in rural areas have access to a decent toilet, nine children die every day due to diarrhoea; one in three shows signs of stunted growth

Another apartheid-era sanitation facility that remains a challenge for the region is bucket and hanging toilets. And it is particularly so for Namibia, where the prevalence of open defecation continues to hover above 75 per cent. On several occasions, President Hage Geingob has admitted that eliminating the "demeaning" system remains a challenge for the government. As the name suggests, bucket toilet is a basic form of dry toilet where a bucket is used to collect faeces and urine. While it serves the purpose in emergency situations like earthquakes, it is a common mode of sanitation for several households in urban and peri-urban areas of Sub-Saharan Africa. In Namibia's Karas Region, the bucket system is synonymous with many villages and settlements. The toilets usually overflow and give off a foul smell if they are not collected in time, and most empty the bucket somewhere nearby the settlement when it is full of human faeces and wash the bucket to use it again. Eliminating the "inhumane and unhygienic" system is part of Geingob's Harambee Prosperity Plan that aims to provide 50,000 rural toilets by 2019. However, due to budgetary constraints, the government has so far identified only 780 households in the Hardap and Karas regions to eliminate bucket toilets, and construct sewer-connected flush toilets. Hanging toilets have buckets or any other container and are mostly portable.

HARSH REALITIES

Understandably, basic sanitation services like sewage network and sewage treatment plants are a rarity in Sub-Saharan Africa. This adds to the burden of diseases in the region. In 2017, WHO prepared a factsheet on the health of children, which shows that Sub-Saharan Africa has the highest under-five mortality rate in the world, with one in 13 children dying before their fifth birthday. In Tanzania, where the prevalence of open defecation has increased over the past 15 years and only 17.2 per cent people in rural areas have access to any decent toilet, nine children die every day due to diarrhoea; one in three shows signs of stunted growth. The Water Aid report says one in every 10 girls misses school during menstruation in Sub-Saharan Africa.

An article on the health effects of water and sanitation in 10 laggard West African countries, published in international journal *Public Health* in 2016, shows that the risk of water and sanitation-related diseases is very high. The authors suggest that there is a need for a strong intervention by the public and private sectors in these countries, because improvement in sanitation and access to safe water will result in alleviation of poverty and prevent the re-emergence of neglected tropical diseases.

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- end uses of biological resources, such as drugs, industrial enzymes, food flavours, fragrance, cosmetics, emulsifiers, oleoresins, colours, extracts and genes used for improving crops and livestock.

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- user shall pay benefit sharing in the form of monetary and/or non-monetary mode.
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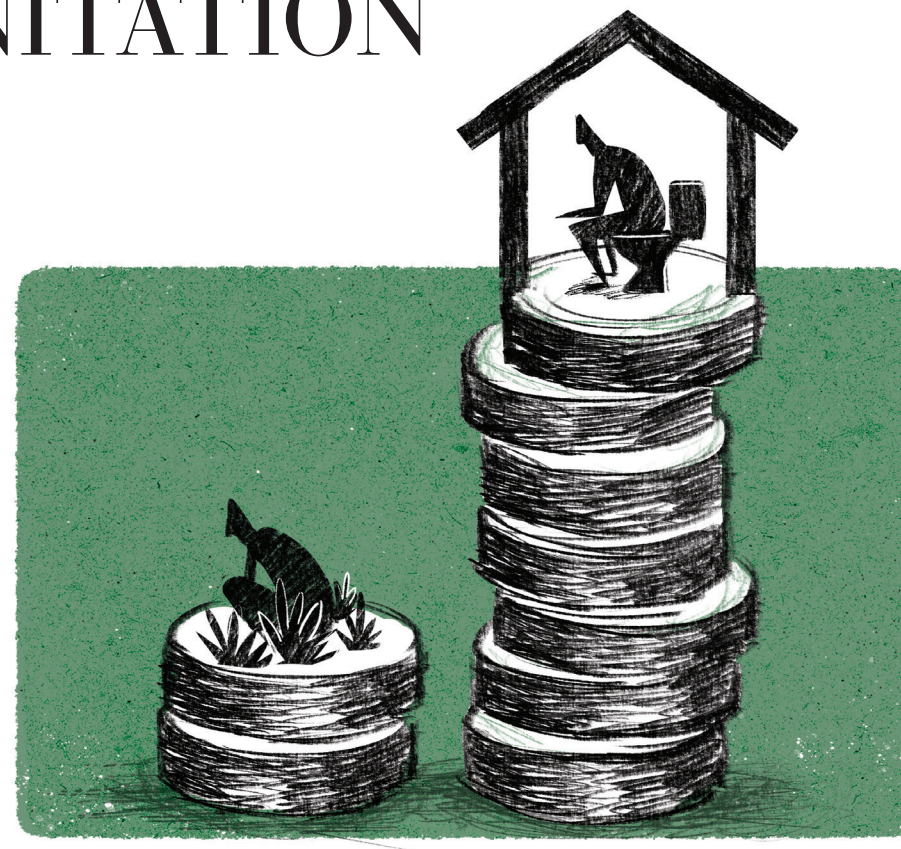
As of now, NBA has granted 149 approvals to the users of biological resources under Form-I.

COVER STORY

FAST TRACK ON SANITATION

Though sanitation in Tanzania is improving, the benefits have largely gone to the rich

KHALID M MASSA



TARIQUE AZIZ / CSE

MOST TANZANIANS use rudimentary and unimproved sanitation facilities, which do not ensure a hygienic separation of human excreta from human contact. These facilities include pit latrines without slabs or platforms or open pit. In 2016, only 34 per cent of the population had access to improved sanitation facilities. But that was a significant jump from a seven per cent rate in 1990.

So though we are improving, the gains have largely benefited the rich. Open defecation is concentrated in some rural areas of the country and is more common among poor communities. The national open defecation rate is 13 per cent, but 75 per cent people who defecate in the open are from the bottom 40 per cent of the population in terms of income.

The health and economic impact of unimproved sanitation is evident. We have had an outbreak of cholera since August 2015 that spread to most of our country. Around 30,000 people suffered from cholera in this outbreak and nearly 500 died. Apart from causing diseases, the World Bank estimates that the country loses US $200 million each year due to lack of improved sanitation. The loss is due to time wasted while looking for a place to defecate, years of life lost due to premature deaths, medical expenses and time lost while caring for a sick one.

In 2012, the government started National

Sanitation Campaign (NSC) to make the country Open Defecation-Free (ODF) before 2025. NSC emphasises the use of improved toilets and washing hands with soap. Our monitoring data shows that open defecation has gone down from 20.5 per cent in 2012 to 5.8 per cent in 2017, while access to improved sanitation has increased from 19.5 per cent to 46.1 per cent in the same period. The budgetary allocation on sanitation has also been increasing in recent years.

Through NSC, at least 12 per cent of villages have been declared ODF. For the first time, one whole district (Njombe District Council) has achieved ODF status. To avoid complacency, we have devised several incentives to ensure that districts and villages maintain their ODF status. Each year, the ministry conducts National Sanitation Competition where winners (districts and villages) are rewarded. A majority of the villages and councils are putting more efforts to secure the top position and in doing so they are maintaining the ODF status.

THE NATIONAL OPEN DEFECATION RATE IN TANZANIA IS 13 PER CENT, BUT 75 PER CENT PEOPLE WHO DEFECATE IN THE OPEN ARE FROM THE BOTTOM 40 PER CENT OF THE POPULATION IN TERMS OF INCOME

Water and sanitation in schools is one of the components under NSC, where emphasis is put on schools to ensure the required infrastructure is provided for. Under this initiative, sanitation clubs have been formed in schools to enable pupils to contribute in improving sanitation practices. Likewise, Menstrual Hygiene Management and provision of WASH services (water sanitation and hygiene) to pupils with disability are focus areas. According to the Ministry of Education, Science and Technology, about one-third of the country's primary schools have improved toilets, which meets the NSC target of one squatting type toilet per 40 girls or 50 boys (1:40 for girls and 1:50 for boys).

Children, particularly those aged below five years, are at an increased risk of contracting communicable diseases, including diarrhoea. When children suffer from diarrhoea, they are denied a right to proper physically and cognitive development. To address this, the country is also implementing the Water Sector Development Program Phase II, where increased access to safe water for rural and urban areas is a top agenda. The country has also developed the National Guidelines for Water, Sanitation and Hygiene in Health Care Facilities to provide quality care, especially for children who are most at risk. Furthermore, we are collaborating with UNICEF to develop Baby WASH strategy (disposal of baby and child faeces). Baby WASH comes under the bigger initiative of WASH and would address issues detrimental to child health, including but not limited to prevention and control of diarrhoeal diseases.

Observance of sanitation and hygiene practices is catalysed by the Behaviour Change and Communication campaign, which the country has embarked on in 2017. This motivates people to use improved toilets and discourages bad practices such as open defecation. Not only that, we also enforce laws to ensure public health. Tanzania has the Public Health Act of 2009 and several bye-laws that are enforced by local government authorities. Enforcement of these contributes to sustaining ODF status and also in reducing the small segment of the population that has no toilets.

Disposal of faecal matter as per technologies that are used in Tanzania can either be *in situ* or off-site. The off-site technology employs the use of sewer while the *in situ* is a disposal right on the site of primary collection through composting latrines or simple pit latrines. The long-term plan is to scale up the use of off-site system so that the sludge is safely transported from the toilet to a distant treatment site, such as waste water stabilisation ponds. A few decentralised waste water treatment initiatives are being undertaken on a pilot basis in Dar es Salaam city. This technology is comparatively cheaper, requires smaller space compared to waste water stabilisation ponds, and can be used in unplanned settlements or slums.

(The writer is acting assistant director, environmental health and sanitation, Ministry of Health, Community Development, Gender, Elderly and Children, Tanzania)

COVER STORY

Lack of cohesion

Africa must identify why it is failing to address its sanitation woes

DESPITE SEVERAL initiatives by global agencies and individual countries, Africa has not been able to check the most basic of all sanitation markers—open defecation. Between 2000 and 2015, the number of people defecating in the open rose from 229 million to 234 million, shows the 2017 data of WHO and UNICEF's Joint Monitoring Programme (JMP) report. However, some countries have had more success than others in curbing the problem. Two neighbouring countries in east Africa, Ethiopia and Kenya, for instance, have similar topography, per capita income and predominantly rural population. But while open defecation has reduced by 50 per cent in Ethiopia between 2000 and 2015, the figure for Kenya is just five per cent, shows JMP. Why are there such huge disparities and inconsistencies?

The main reason is that most countries do not have a cohesive policy to deal with sanitation issues. According to a study by the Stockholm Environment Institute, published in January 2018, only five countries—Rwanda, Uganda, Tanzania, Nigeria and Ghana—have designated ministries for policy formulation, financing,

CREATIVE COMMONS

regulation, monitoring and implementation. Though Ethiopia is not in this list, it has succeeded in fighting open defecation because in 2013, the government rolled out a national programme—One WASH (water, sanitation and hygiene)—to synthesise sanitation work carried out by six ministries (water, irrigation, electricity, education, finance and economic development) with the health ministry. On the other hand, in Kenya, sanitation is under the purview of the health ministry.

Lack of coordination between policies framed by the Central ministries and the implementation carried out by local authorities is another area of concern. For example, guidelines for toilet technologies in Rwanda prescribe design, location and condition standards, but these are rarely followed by local authorities.

Money is an obvious roadblock for most African countries. In 2017-18, Kenya required about US $600 million a year to meet the sanitation goals set by the health ministry. But the budget allocated was only 6.5 per cent of the figure. "The gap in terms of availability of funds is huge and this impacts our targets," says Janet Muse, head, WASH Hub, a dedicated cell of Kenya's health ministry. Another country facing a severe financial crunch is Namibia. In this southern African country, over 60 per cent population do not have access to improved toilets—a term used by WHO to define toilets where there is a hygienic separation of human excreta from human contact. In 2016, Namibia launched the Harambee Prosperity Plan to convert bucket toilets (a dry toilet where a bucket is used to collect excreta) into improved toilets. But in about one year, it just managed to construct 886 toilets because it does not have money, say media reports.

Open defecation has reduced by just 5 per cent in Kenya between 2000 and 2015. There is no separate ministry to oversee sanitation in the country

Governments are also not spending enough to popularise improved toilets. As per the Ngor Declaration, adopted at the fourth African Conference on Sanitation and Hygiene in 2015, all African countries must spend 0.5 per cent of their GDP on sanitation and hygiene. "Based on the limited data available, budget allocation to sanitation appears to be far from the targeted 0.5% of GDP," states "Government investment in sanitation: 2016 State of play", a report published by the UK-based non-profit Water & Sanitation for the Urban Poor and US-based non-profit International Rescue Committee. The report finds the Democratic Republic of Congo is the best performer, spending 0.39 per cent of its GDP on sanitation in 2012, while Ethiopia and Ghana were the worst, having spent 0.01 per cent each.

In fact, Ghana's continued inability to fight sanitation problems has contradicted the view that political stability is a perquisite to improve sanitation. The country has one of the continent's fastest Human Development Index growth rate and is a stable democracy. But as per UNICEF, Ghana would take 500 years to become open defecation-free. Moreover, it will not be able to meet the United Nations' Sustainable Development Goals for water and sanitation by 2030 if it is unable to check open defecation.

Where is it falling short? "Bottom to the fore", a report by Delhi-based Centre for Science and Environment in 2018, says, "Unclear direction and weak strategy, coupled with lack of intent in execution are the main culprits." Ghana did not have a dedicated sanitation ministry till January 2017. Before that, sanitation was overseen by the Ministry of Water Resources, Works and

Housing. Since sanitation was only a part of the mandate of this umbrella ministry, it could not command the ministry's undivided attention.

The problem is also cultural. Most Ghanaians associate heat and smell from latrines with diseases, and believe open defecation is the normal option. The government has not taken measures to induce behavioural changes. A July 2016 study published in *BMC Public Health* says that increasing migrant population and the high demand for housing in the face of limited availability of space has resulted in general unwillingness and inability to establish private sanitation facilities in the communities in Ghana. The study also reports that landless people are unwilling or unable to spend on sanitation. About 80 per cent of Ghana's population is landless.

Kenya's Ntugi village has become open-defecation free despite being water-stressed by constructing lined pit toilets, which are water neutral

"At present, Sub-Saharan Africa is focussing on traditional or rudimentary toilets which are not safe. Countries should offer affordable technologies that can fight the adverse effects of poor sanitation," concludes Anyitike Mwakitalima, coordinator of the National Sanitation Campaign, Tanzania.

REVISIT, REFOCUS, RENEW

A World Bank assessment of 18 African countries that account for half of the continent's population in the continent, says economic losses incurred due to poor sanitation is equivalent to between 1 and 2.5 per cent of their GDP. The true cost could be much higher as it does not factor in indirect effects of poor sanitation, such as the costs of epidemic outbreaks or losses in trade and tourism revenue. Given the situation, countries need to immediately focus on sanitation by:

Increasing investment: The budget for sanitation in African countries is abysmally low. The worst performing African countries are not even meeting the 2015 Ngor Declaration commitment of spending 0.5 per cent of their GDP on sanitation and hygiene. The higher budget has to be supported with effective planning that should be long-term and at the same time participative as use of toilets require behavioural shift. The plans should also address the needs of women and girls.

Promoting low-cost, effective technologies: No doubt, Africa's sanitation challenge requires huge investments. The financial burden, however, can be reduced through low-cost sanitation technologies. For example, Rwanda is promoting a low-cost decentralised system to reuse wastewater, says a 2013 paper titled *Challenges to Achieving Sustainable Sanitation in Informal Settlements of Kigali, Rwanda*. The technologies should also be region-specific. A classic example of this is Kenya's Ntugi village, which despite being water-stressed has become open-defecation free. Using locally procured raw materials, people in the village have built lined pit toilets, which are water neutral.

Developing sound database: Accurate data helps identify problems better, and improve assessment of interventions. But data scarcity is a major problem in the region. India has backed its open-defecation free programme with real-time data which monitors the target and the achievement status of toilet construction at the level of individual households in every village (see 'Valuable lessons...' on *p*48).

Ensuring better monitoring and evaluation: Strong monitoring systems should be developed as a priority to check the implementation of sanitation policies. A 2011 African Development Bank group publication says that given the limited statistics and data collection capacity, 5-10 per cent of the budget of major projects in Africa needs to be spent on monitoring.

Finally, African governments need to build on the positive steps they have taken recently. In 2013, African leaders voluntarily adopted Agenda 2063—a set of seven "aspirations" that resemble the SDGs. They envision an "Africa you would like to have 100 years after the founding of the Organization of African Unity". Such steps should be encouraged and promoted in every country of the continent.

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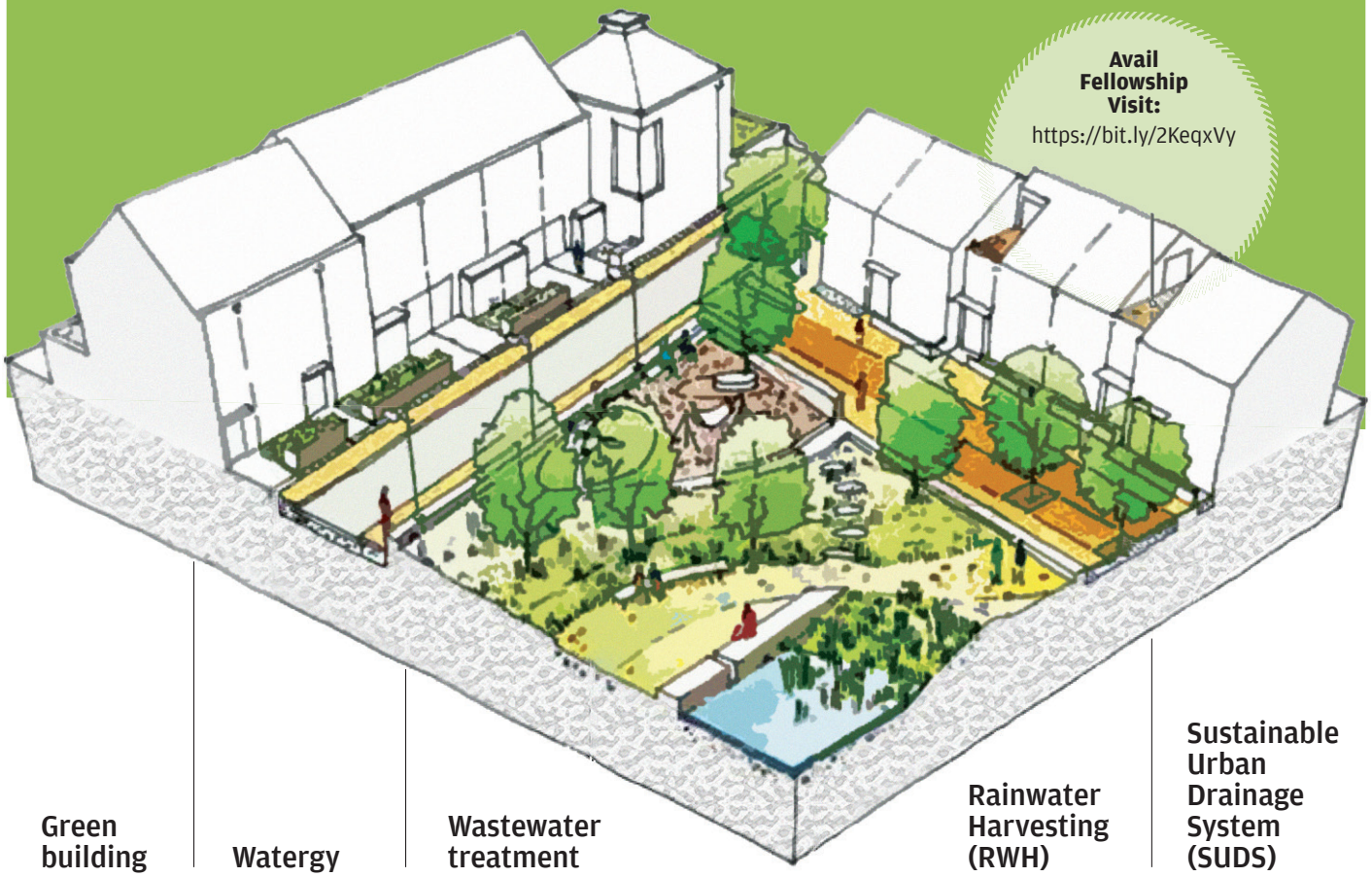

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COVER STORY

VALUABLE LESSONS IN TOILET BUILDING

Despite the limitations of the Indian model of sanitation, Africa can draw inspiration from its many positive aspects

KAMAL KAR

TARIQUE AZIZ / CSE

DURING THE last decade of the Millennium Development Goals (2005-2015), many African nations improved their water and sanitation status. One of the important factors that led to this was the adoption of Community-Led Total Sanitation (CLTS) approach. Though CLTS was introduced in Africa nearly seven years after its launch in Asia, it received wide acceptance.

All the 54 African countries, barring the relatively developed northern ones, introduced and scaled up CLTS by focusing on empowering local communities to end open defecation. This was done by inculcating collective behavioural changes sustainably, rather than waiting for subsidy from external agencies or governments. Earlier, there was hardly any country that implemented its national sanitation programme independent of the directives of funding or donor agencies. The loan or grant mostly came with the baggage of directives on toilet design, mode of supply of hardware and disbursement, including an outline for identifying the beneficiaries.

But this changed after 2007 when many countries, who depended on external funding support, continued to demand funds or grants, but voiced their preference for no subsidy-CLTS approach over free and subsidised sanitary hardware supply. It proved convenient for many countries to incorporate CLTS, which previously faced challenges in mobilising huge funds for behaviour change.

EMBRACING BEHAVIOURAL CHANGE

The rollout and adoption of CLTS has been so drastic that the number of open defecators in sub-Saharan Africa (SSA) has reduced in comparison to India. The UNICEF/WHO joint monitoring programme report suggests that between 2000 and 2015, SSA witnessed a decline in open defecation from 32 per cent to 23 per cent compared to India's 66 per cent to 40 per cent.

The inspiration came from India, Bangladesh and Nepal that experimented with CLTS before Africa. Many African countries, which did not want to depend on grants to construct free household toilets (these were often not used for the purpose they were built for in the first place) changed their strategies by shifting to CLTS so that they could use the same grants or funds for initiating behavioural change. It was difficult for many of these countries to waste resources on supply-driven sanitation approach, which did not necessarily see significant impacts in reducing open defecation as is being followed by some Asian nations like India and Cambodia.

AFRICA CAN WITNESS SUCCESS IF IT PRIORITISES SANITATION JUST LIKE INDIA HAS GIVEN IT TOP NATIONAL IMPORTANCE

The Asian problem is that in some countries free or subsidised toilets constructed either by the government or developmental agencies continue to be the focus. Thus, there is less emphasis on local empowerment. One of the most striking examples of a national sanitation strategy developed in India is based on the assumption that local communities lack awareness. Also, as they are unable to change their habit of open defecation or are financially incapable of constructing toilets, free or subsidised toilets are a must. The household hardware subsidy amount in India has increased ten-fold over the past couple of decades. While India has spent billions of dollars through sanitation programmes on toilets, the usage of the same has remained far from satisfactory.

Africa should take note of two factors when it comes to comparison with India: first, the rather slow progress in terms of collective behavioural change in India as compared to many of its nations owing to a different enabling environment. Second, the convergence of the three essential elements of CLTS—behavioural change (personal, professional and institutional), understanding CLTS tools and techniques (from pre-triggering to post-triggering, and post open defecation-free sustainability) and enabling environment (policy context, inter-institutional coordination and budget protocol)—is missing in India. However, Africa has successfully created a synergy of these elements to enable authorities and communities. This actually determines the true progress of CLTS, resulting in many positive health outcomes.

INSPIRATION FROM INDIA

Despite several limitations of the Indian model of sanitation, Africa can still emulate its positive aspects. The continent can witness more success if it prioritises sanitation just like India has accorded it top national importance under the Prime Minister's flagship Swachh Bharat Mission (SBM). Further, African nations can emulate India's systematic involvement of government and non-government institutions across all levels.

Here, it is important for Africa to realise that in a federal system like India, states have to mobilise matching grants to go with the national funding support from the Centre to make SBM successful. In other words, the national mission is not implemented through a single source of funding, but through a collective initiative duly contributed by various funding sources.

One of the most successful initiatives of India is the formation of Self-Help Groups (SHG), which are savings and credit groups formed by poor women to collectively manage billions of rupees. It is interesting to see how the Indian government has successfully involved them in SBM.

Finally, Africa may learn valuable lessons from the media campaign launched under SBM, where the message is constantly broadcast through over 800 TV and 230 radio channels across the country. This leaves no stone unturned to ensure that the message is loud and clear: end open defecation in India by October 2019.

However, only time will tell whether these efforts will leave the country saturated with largely unused household sanitation facilities or whether open defecation will become a thing of the past.

(The author is founder chairperson of CLTS Foundation, a non-profit based in Kolkata)

COVER STORY

LOOK BEYOND THE LOO

In fast-urbanising Africa, the governments must rework their usual toilet building strategies to ensure safe disposal of waste

SUNITA NARAIN

TARIQUE AZIZ / CSE

OVER A decade ago, when the world began discussing targets for sanitation the idea seemed simple—build toilets and people will use them. When the UN's Millennium Development Goals (MDGs) set in 2000 came to an end in 2015, over 2 billion people had gained access to improved sanitation. But nearly 2.6 billion people still had no or poor sanitation facilities—it was the world's unfinished agenda. The Sustainable Development Goals, which succeeded MDGs, have now set an ambitious global goal to completely get rid of this wicked problem—by 2030 all citizens of the world must have access to clean water and improved sanitation. India (particularly, the laggard states of Odisha, Bihar, Goa, Tripura, Jharkhand and Uttar Pradesh) and Africa hold the key to this transition. So, where are we today?

The past two decades have taught the world some crucial stuff. Firstly, it is clear that toilets do not equal safe sanitation. The faecal matter, if excreted into a poorly made pit in the ground or a latrine connected to an open drain (as is the case in most places) will contaminate the environment and add to the health burden. So, if toilets must lead to the benefits that they are designed to do—reduce waterborne diseases, improve nutrition of children and increase productivity—then sanitation has to be approached differently. The toilet has to be built with provisions for management of human excreta. The toilet must also be built with provision for water. Once again, if people cannot wash hands or clean the toilet then it will add to the health burden. This is the toilet+ strategy.

Secondly, there is the realisation that toilets without changes in behaviour will not work—they could be built but not used. This is why the world now agrees that it must focus on educating people of the benefits of using toilets, and the most important trigger is to link the benefits with health. It is also clear that cajoling people into changing their habits can be done best by their communities. This is the toilet++ strategy. But the question is if these learnings are enough!

Currently, India is pushing hard to meet its own open defecation free (ODF) goal of 2019. There is no doubt that much headway has been made in building toilets and in communicating the message of safe sanitation. The Indian government has been dogged and aggressive—which is much needed in this sector. It has also put its money where its mouth is. The government's Swachh Bharat (clean India) Mission has, on the face of it, no financial constraints. It is expected that by 2019, most of the toilets will be built; cities and villages will be declared ODF. This is good news for the world because till now, six of the 10 who defecated in the open, were from India. This is good news. No question.

AFRICAN CITIES ARE BUILDING AN UNSUSTAINABLE AND UNAFFORDABLE WATER AND WASTE SYSTEM

But will this be enough? I suspect that post-2019, the sanitation questions in India will be different, yet the same: how to ensure that the toilets continue to be maintained and used, and how to make sure that human excreta is safely handled. If this is not done then the massive investment of counting toilets could be wasted. Worse, the government would now believe that their task is done and priorities changed. But the expected health outcome, which requires not just building and using toilets but ensuring that water is not contaminated, will not be realised. This clearly must be avoided at all costs. For the Indian toilet success to have a sustainable future, monitoring and public scrutiny must continue. The government must not rush to claim success, not yet.

What then are Africa's options to safe sanitation? Remember that Africa is urbanising fast. It is living increasingly and explosively in peri-urban and urban settlements, which are brutally poor and invariably informal. The fact is African cities, like all others in the now-fast-developing world, are building a completely unsustainable and unaffordable water and waste system. Cities are bringing water long distances; losing much in distribution losses; and spending all they have in supplying expensive water to some and never to all. Water inequity then leads to waste unsustainability. The same cities do not have funds to build underground pipelines to connect, intercept and then transport the waste discharge from each household to sewage treatment plants. This means untreated waste keeps flowing and contaminating. It is inevitable. Governments simply do not have the wherewithal to provide safe water and then safe sanitation to all.

We need alternative ways of handling water and waste that are affordable and so sustainable. This means first thinking of how to reduce the cost of water supply—if water is expensive then waste will not be managed. This means thinking of local water sources to cut the length of the pipeline. Ironically, governments cannot tap local water sources because these are increasingly contaminated by untreated waste. This cycle must be broken.

This also means finding cheaper—much cheaper—options of treating waste that comes out of toilets. This is the other irony of our times. We can take a man to the moon. We can even treat the excreta of the man on the moon. But we cannot build affordable sanitation systems for millions in our world. As yet the toilet technology is either rudimentary (just a pit in the ground) or so expensive that it cannot be afforded by most (flush toilets connected to miles of underground pipes leading to treatment plants). There is nothing in-between that has been tried out at scale.

But this is where the next toilet revolution must come. It must not be in building the toilet but in building the toilet with the system for safe disposal of waste. And this is where the opportunity lies. Human waste is a resource—it is about nutrients that could potentially enrich the soil, add to productivity. The problem is that it also has pathogens and many things that are not so nice. So, can this resource be reused—reworked into the land and not disposed of in water? Can the water and sewage paradigm move towards local recharge and local recycling? Can it? It must. ■

@down2earthindia

Will sikiya return?

The Baiga community vouches for this millet's delicious taste, but many have no access to it now. **DEEPANWITA GITA NIYOGI** travels to Madhya Pradesh to find out what is causing the disappearance

BAIGAS, I have heard, are no less than ecologists. People of this tribal community possess the legendary ability to recognise hundreds of species around them and know their usage in myriad ways. Knowing their traditionally rich yet minimalistic ways of life is on the top of my mind as I proceed towards Dhaba village in Madhya Pradesh's Dindori district. Dhaba is among the 52 villages across Dindori whose hills and forests have been home to the primitive tribe for millennia. As I climb the steep slopes of Dhaba, I meet a resident, Rangulal. His face lights up when I mention *sikiya*, a millet called *Digitaria sanguinalis* in scientific lexicon, grown and relished by Baigas. "It has been a long time since I have eaten *sikiya*. It is no longer found in my village," he says.

In fact, after a brief inquiry about the millet in Dhaba, I realised that the younger generations have not even heard of *sikiya*, let alone taste it. And a prime reason for this is the changing agricultural practices of Baigas.

Traditionally, this primitive tribal community practise *bewar*, a shifting, slash-and-burn method of farming in which the land is left fallow after three years of growing crops. "Though often derided by forest officials and agriculture scientists, *bewar* respects the forest ecosystem," says Naresh Biswas, secretary of Nirman, a non-profit in Madhya Pradesh. He adds that Baigas usually burn the invasive lantana bushes to prepare the field. As the rains approach, they simply scatter the seeds of a variety of food crops without tilling the land. This high crop diversity, at times comprising over 20 varieties, has traditionally taken care of their nutritional needs.

However, Jiribai of neighbouring Pauri village says *sikiya* is rarely sown. "Seeds that drop to the ground during harvest add to the natural growth," Jiribai says.

Discussions with researchers show that *sikiya* is a perennial wild grass species and easily re-grows from the rootstock as soon as

PHOTOGRAPHS BY VIKAS CHOUDHARY / CSE

Laheri of Baiga tribe in Madhya Pradesh shows *sikiya* as a plant, and its whole and dehusked grains

the weather is favourable. Though *sikiya* is yet to be thoroughly studied, Biswas says the crop diversity on *bewar* plots is crucial for its growth. The millet is disappearing from the food plate of Baigas as more and more families are abandoning multi-cropping and growing *arhar* (pigeon pea). "We have shifted to *arhar* as it fetches us cash," says Ramlal Rathuria, sarpanch, Bouna village.

Small yet filling

Elsewhere considered a weed, Baigas have for centuries nurtured *sikiya* as food, which they use to prepare *kheer* (porridge). In appearance, its grains—light yellow in colour—are smaller than those of little millets. "It is more filling than rice. Just 250 gm is enough to carry me through the day," says Hariram of Silpidi village, where the Baiga community still harvests and consumes *sikiya*. Gawalinbai, another Silpidi resident, says it is easy to cook. "One has to just boil the milk and add the required quantity of *sikiya* for a delicious *kheer*. It strengthens the immune system," she adds.

"I have been eating *sikiya* every morning. It tastes better than other millets. We get around 300 kg of *sikiya* in a plot of 2-3 hectares," says sexagenarian Ghunthu of Dumar Tola village.

Despite its glorious tradition, *sikiya* is not known to people outside the Baiga community. It does not even feature in the list of millets being promoted by the Centre as "nutri cereals". Based on his interaction with Baiga farmers who were showcasing the rare millet at the Using Diversity Seed Festival, organised early this year in Bhopal, Krishna Prasad of Bengaluru-based non-profit Sahaja Samrudha, says, "One of the reasons *sikiya* has failed to command mass appeal is that processing the millet is arduous. Traditionally, Baiga women use *musar*, a heavy wooden stick, to remove its hard outer covering. Its small size makes the separation of the grain from stones difficult." He adds that efforts need to be made to design suitable processing machines. Interestingly, *sikiya* is also called the Polish millet as farmers in Poland grow and eat the millet, and use it as fodder. It is also grown in Germany.

While the government remains ignorant about *sikiya*, Biswas and several others are trying to popularise it. Biswas has sent grain samples to the Indian Institute of Millets Research (IIMR), Hyderabad, for nutritional analysis. "*Sikiya* is a crabgrass finger millet. It has always been part of tribal culture. All we know about it is that the millet has 12 per cent of protein. Analysis of vitamins, calcium, iron and amino acids is still going on," says Vilas Tonapi, director, IIMR.

To assess if *sikiya* can thrive outside Baigas' homeland, Soumik Banerjee, a native seed conservationist from Jharkhand's Godda district, and researchers at the Jawaharlal Nehru Krishi Vishwavidyalaya (JNKV), Jabalpur, are growing it on an experimental basis. "Last year, we sowed *sikiya* in September and harvested it in February," says Ajay Singh Gontia, who heads the plant physiology department at JNKV. His department plans to grow the millet again this year. But will such efforts ensure the return of *sikiya* to the Baigas' food plate? ■

@deepanwita_t

RECIPE

Sikiya mango kheer

INGREDIENTS

Milk: 500 ml

Sikiya millet: 1/2 cup

Sugar or jaggery: 2 tsp

Mango pulp: 1/2 cup

Diced mango: 8-10 pieces

Dry fruits: almonds, cashew nut and raisins

Whole cardamom: 4-5 pieces

Cinnamon: use half a bark, break it into smaller pieces

METHOD

Pour the milk in a pan and bring it to a boil. Add 5-6 teaspoons of mango pulp to it. Keep stirring to ensure that the pulp dissolves in the milk and does not form lumps. Add cardamom, cinnamon and *sikiya* to it. Stir well for five to seven minutes. Transfer the contents into a bowl. Garnish with dry fruits and mango pieces. It can be enjoyed both hot and cold.

For those who want to use jaggery, instead of sugar, need not use the mango pulp. Besides, add the jaggery only after the porridge is ready and removed from the stove.

PATENTLY ABSURD **LATHA JISHNU**

Fake science, shady journals

India is way behind in the patents it files, the reason being that much of its science is of dubious quality

THE ANNUAL report of the Controller of Patents released in July 2018 made for the usual dismal reading. Patent applications filed by Indian entities may have gone up a teeny bit, but overall, the numbers are depressing. Of the 45,444 patents filed in India in 2016-17, less than a third—the exact figure is 13,219 or just 29.2 per cent—came from Indian applicants. Unsurprisingly, the highest number of patent claims (8,981) were filed by US firms, followed by the Japanese (3,399) and the Chinese with 2,256.

These, of course, are patent filings and not the number of patents granted, but all the same is indicative of the trends in innovation. In March, the Geneva-based World Intellectual Property Office (WIPO) had signalled a change in the geography of innovation when it announced that China had moved to second position among international patent applicants. China was closing in on the leader, the US, with two of its telecom firms, Huawei and ZTE, emerging as the top filers.

TARIQUE AZIZ/ CSE

WIPO Director General Francis Gurry was all gush for China's rapid rise in the international patent system, saying that it showed Chinese innovators are "looking outward, seeking to spread their original ideas into new markets" as their economy transforms rapidly. Putting his finger on the critical factor, Gurry says, "China is going from 'Made in China' to 'Created in China"—a lesson for India where Made in India is the new buzzword. An idea of how much catching up India has to do is given by these figures. Chinese companies filed 48,882 applications while India's came to a mere 1,603. Just Huawei and ZTE alone filed close to 7,000 applications

The record of Indian entities at home is equally pathetic. The top filers are the Indian Institutes of Technology (400), Wipro (226), the Council of Scientific and Industrial Research or CSIR (225), Mahindra & Mahindra (205) and Bharat Heavy Electricals (174). CSIR is the country's premier national research and development (R&D) organisation with 38 laboratories under it.

A clear indication what ails Indian science and technology was the exposé recently by *The Indian Express* of the pay and publish science/ academic journals that have mushroomed. Peer-reviewed academic publishing is the definitive yardstick of the quality of R&D but in India, fake or shoddy science is published in these predatory journals where scientists pay to have their work published.

Although of dubious quality, the journals are approved by the University Grants Commission and even by the august National Academy of Agricultural Sciences. The latter has two categories for assessing the impact factor (IF) of the journals. The first includes top journals like *Nature* with IF rating by Thompson Reuters. Publication in this lot yields up to 20 marks. The second category is the predatory journals without IF rating. However, scientists can still get 2-8 marks for such papers. So, scientists pay to publish 2-3 papers in predatory journals and get promoted, however, spurious their science (see 'Maya of Indian Science', *Down To Earth*, 16-31 December 2012).

The *babu* culture continues to flourish in the top public laboratories, especially in the Indian Council of Agriculture Research. Ergo, no worthwhile research, no breakthroughs—or patents. ■

Pluralistic approaches to conservation

A collection of nine essays highlight the messy nature of conservation in post-reform India and unravels lesser-known species, habitats and eroding traditional values

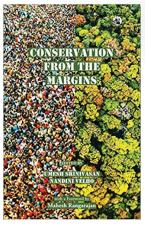
TIASA ADHYA

CONSERVATION PROBLEMS are complicated. The successes made today can dissolve tomorrow. While it is easier to adapt to local changes, what about the bigger political and economic forces that are rapidly altering the way we view and value nature?

In my own experience of researching the fishing cat for almost a decade, I realised how development policies threaten it by simply categorising its habitat—wetlands as "wastelands", to make acquisition easy for agriculture, aquaculture and urbanisation. Each year till 2030, a city the size of Chicago will be built in India to meet the demands of the growing populace. Where else will the space come from if not from the "wastelands"?

The book, *Conservation from the Margins,* shows how globalisation-induced changes are becoming a prominent threat to diverse species in India. It is a collection of nine essays by conservation scientists and practitioners working in the fields of ecology, anthropology, sociology and economics. Each essay provides an insight while highlighting issues invisible to mainstream consciousness—those of overlooked species, ecosystems and the co-inhabiting human communities, often historically marginalised.

For instance, big dams like the Farakka Barrage have wreaked havoc on the Gangetic river dolphin by reducing fish stocks prodigiously and disrupting traditional fishing practices. Nachiket Kelkar studies these remarkably resil-



CONSERVATION FROM THE MARGINS
Umesh Srinivasan, Nandini Velho
Orient BlackSwan | 296 pages | ₹975

ient cetaceans as their survival intersects with fresh social conflict, unfolding since globalisation, over scarce fish resources. Everyone tussles to get the coveted government ID cards to fish legally. The fish mafia barricades the river with nets that decimate the future fish stock. Although some fishers understand how the river, fish and dolphins are suffering, they are forced to adapt their identities and change their "ecological" values, cutting off the last social threads to the dolphin.

From freshwater ecosystems to marine spaces, accelerated resource exploitation is pushing dolphins, turtles, sharks, rays, guitarfish, sawfish and wild fish populations to the brink and is also disrupting traditional and ecological practices.

Divya Karnad's essay flags the inadequacies of the legal framework in fisheries management and is germane. Lack of uniformity when it comes to states' rules and regulations make it worse. If you are banned from fishing in Kerala's waters, for example, you can migrate to the waters of Maharashtra to fish and no one could stop you. And the fisheries department is not even authorised to the arrest culprits. Coordinating with the marine police within territorial waters and coastal guards in the contiguous zones is a cumbersome process. Karnad also cautions against the top-down implementation of laws and advocates recognising the value of traditional egalitarian fishing societies and their sustainable customs. After all, such customs have evolved since the Stone Age and are undoubtedly far better in understanding the aquatic world.

In the context of the importance of public relation skills among government officials, the article by S E H Kazmi is an eye-opener. Kazmi was the Divisional Forest Officer of India's first and perhaps its unluckiest tiger reserve—the Palamau Tiger Reserve in Jharkhand. A beacon in the dark, Kazmi earned the trust and respect of ultra-left political activists and tribal forest-dwellers. His moratorium had deterred the hydro-electric dam in the reserve that could have drowned the forests and people. Unfortunately, he was reprimanded as an anti-national sympathiser and obstructionist by the State.

Sutirtha Dutta, an expert on the Great Indian Bustard (GIB) with the Dehradun-based Wildlife Institute of India is bold in his assessment of the primary threats to the Bustard's existence. His essay comes alive with two characters, first the nomad pastoralist, unwilling to barter his freedom for a daily wage and GIB, already bartered for "development". Both are "aliens" in their own land as the once extensive grasslands have now been reduced to bread crumbs. "Development" has modernised these "wastelands", at the cost of 20,000 million hectares of grasslands between 1980-2010 and caused the breakdown of traditional systems that managed natural resources.

This review would be incomplete without a word on the two remarkable essays about conservation problems

Development has "modernised" wastelands, at the cost of 20,000 million hectares of grasslands between 1980-2010 and caused the breakdown of traditional systems that managed natural resources

in the Northeast by Umesh Srinivasan and Nandini Velho. Ivory and timber in Assam's forests is being ravaged by an ongoing war. Yet any attempt to build a conservation movement is thwarted in its embryonic stage. Meanwhile, market forces are influencing hunting customs and the distinctions between subsistence and commercial hunting are evaporating. The book also deals with the fatalistic scale of organised poaching. Automated weapons, night vision goggles and helicopters maximise success of the traditional methods. With 1,000 per cent return on investment, illegal wildlife trade remains a formidable challenge to conservation practitioners.

The essays are based on rigorous science and lucid anecdotes. The book should definitely be included in graduate and post-graduate courses on wildlife and conservation in the Indian academia. Not only does one get to know what ails conservation in India but the scenario is relevant for Latin America and Africa—developing economies populous with rich biodiversity. For these reasons, the book is highly recommended for conservation practitioners and wildlife enthusiasts . ■

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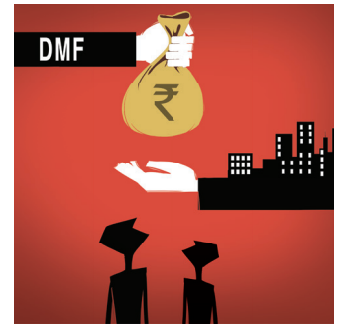
STRAIGHTFORWARD CHANDRA BHUSHAN

A dig at the poor

District Mineral Foundations were set up to improve the lives of people affected by mining. But maladministration is defeating its *raison d'être*

ONE OF the most important but least talked about legislations enacted by the National Democratic Alliance (NDA) government is the District Mineral Foundation (DMF), which was instituted in 2015 under the Mines and Minerals (Development and Regulation) Act, 1957, to "work for the interest and benefit of persons, and areas affected by mining-related operations". This is the first legislation in the history of independent India that recognises the rights of people to benefit from their natural resources, in this case, minerals. The fact that India's richest mining districts are inhabited by some of the country's most deprived population prompted the government to set up the DMF. Mining companies have to give an amount equal to 10-30 per cent of the royalty to DMFs for investments to improve the lives of mining-affected people.

In the three years of its existence, DMFs have collected close to ₹20,000 crore. But how is this money being used? Are DMFs serving the mining-affected people? These were some of the key questions that my colleagues at the Centre for Science and Environment have answered in a recently released report on the DMFs (https://bit.ly/2NZMtG0). The key observation of the report is that instead of functioning as a people's institution, DMFs are slowly turning into a government scheme. Mining-affected persons have been systematically removed from the DMFs.



TARIQUE AZIZ / CSE

The administration of DMFs in all states is dominated by officials and political representatives; representatives of mining-affected communities have been completely excluded. Worse, some states are increasing the role of politicians. For instance in June this year, Telangana amended its DMF rules to include all MPs and MLAs in DMFs.

The law says that investments should be made on the recommendations of the Gram Sabhas, but none of DMFs have engaged them so far. Gram Sabhas are mandated to identify beneficiaries and monitor the implementation of projects. But they have not been empowered to do so. As a result, no DMF has identified beneficiaries.

Of the ₹20,000 crore, DMFs have sanctioned projects worth ₹11,000 crore. But there is a big question mark on the sustainability and intended beneficiaries of these investments. First, DMF investments are heavily focused on construction activities; emphasis on improving human resources and to remove destitution is minimal. Second, affected people and areas are not getting these investments. For instance, Jharia, one of the most affected areas of the country, has not received a single rupee from Dhanbad's ₹935 crore DMF fund. In contrast, DMF funds are being diverted for urban projects. In Odisha's Jharsuguda district, funds are being diverted to supply electricity to an airport.

All this is because DMFs have failed to set-up administrative structure to undertake bottom-up planning and implementation. Except for a handful, no DMF has set up an office; they are operating in an *ad hoc* manner with intermittent meetings of DMF bodies where decisions are taken without involving the affected people. Importantly, there is little transparency—most DMFs are not putting information on investments in the public domain, which is mandatory by law. Barring a few, most DMFs have not carried out financial audits.

The fundamental fact is that DMF is not a government scheme. It is an institution to facilitate the people living in mineral-rich areas of the country to benefit from their mineral resources. Till this is internalised by the state governments, DMFs will keep failing. ■

@Bh_Chandra

ANIL AGARWAL ENVIRONMENT TRAINING INSTITUTE (AAETI)
A Centre for Science and Environment initiative

TRAINING PROGRAMME

Toilet technologies, water management and solid and liquid waste management in rural areas

There is a serious lack of safe drinking water and sanitation in India, especially in rural areas. Clean drinking water coverage has been slipping back -- in the period 2006 to 2009, two million people slipped from fully covered to partially covered status. Between 2001 and 2014, on an average, about 140,000 habitations have slipped back every year from full coverage status. In sanitation, the picture is bleaker: almost 60 per cent of the world's open defecation happens in India, says a UN report. The economic burden of poor sanitation is immense. It accounts for almost half of the total global losses and 5.2 per cent of the nation's GDP.

Anil Agarwal Environment Training Institute (AAETI), a Centre for Science and Environment initiative, offers a 4-days training programme aimed at understanding the problem and exploring the solutions to it. The training will be conducted at AAETI's residential training facility in Nimli by acknowledged experts from the field.

THE KEY TAKEAWAYS:

1. Comprehensive understanding of the state of water and waste management in rural India
2. Insight into traditional wisdom on water management in different ecological regions of India
3. Access to success stories on community-led water management projects
4. How to design water harvesting projects in rural areas
5. How to use of Information, Education and Communication (IEC) materials effectively for behavioural change to move towards an open defecation-free state
6. Knowledge of toilet technologies practised in different ecological regions of India
7. Understanding of decentralised technologies used for management of grey and black water
8. How to design decentralised wastewater treatment systems, and how to monitor their efficiency
9. Site visits and real-time problem analyses

COURSE FEES

The fees will be **Rs 20,400** per person. Participants will be offered a shared occupancy.
If any participant prefers a single occupancy, the fees charged will be Rs 26,400 per person.

The fees will cover pick up and drop from Delhi, boarding and lodging at Nimli and field trip costs.

COURSE DURATION

11-14 September, 2018

COURSE VENUE

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