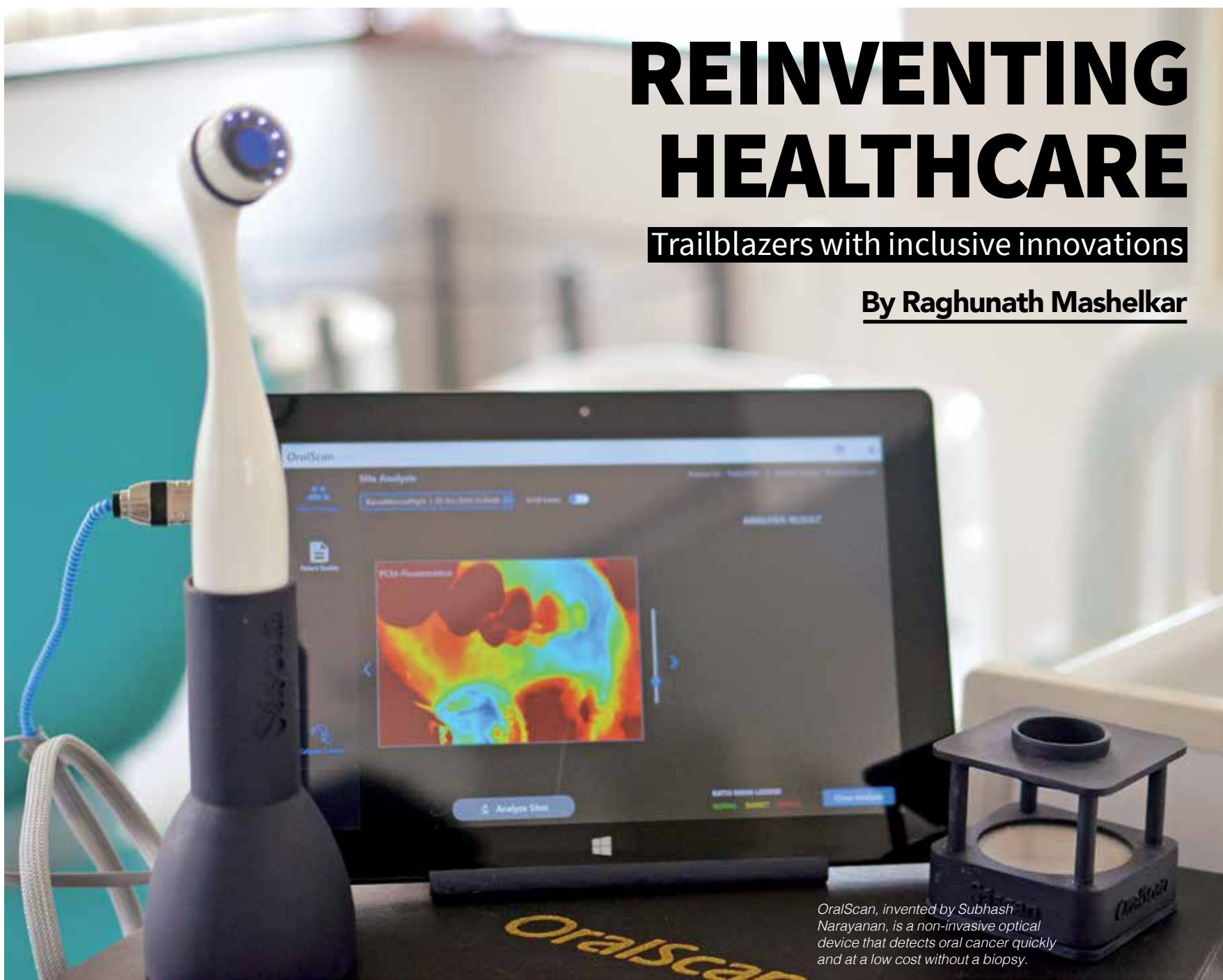


Civil Society

REINVENTING HEALTHCARE

Trailblazers with inclusive innovations

By Raghunath Mashelkar



OralScan, invented by Subhash Narayanan, is a non-invasive optical device that detects oral cancer quickly and at a low cost without a biopsy.

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IN CIVIL SOCIETY EVERYONE IS SOMEONE



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covers you
would not
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IN THE LIGHT

SAMITA RATHOR



LETTERS



Creating equality

I read Anil Swarup's article, 'A lot to learn from NGOs in school education' and I completely agree with him. My NGO worked with 20 Kasturba Gandhi Balika Vidyalyaya Schools in Nalanda district of Bihar and demonstrated the same spirit that he mentions. UNICEF funded the project and the government supported us. We could produce interesting output and outcomes. Now we are working with two government schools in Nalanda. This collaboration was facilitated by the district education officer, Manoj Kumar, who passed away last year due to COVID.

During the pandemic, when schools were closed and the learning deficit increased, the government did not have a method of reaching children. We created decentralized Swadhyay Groups of children with local interns and tried to address the learning deficit. We have the

commitment to make society better but we can do so only if the government supports our efforts.

Subodh Gupta

'For rural healthcare, it is back to basics' was a terrific piece that acknowledged the deep disparities and challenges in the health system. It also offers inspiration and hope with the growth of institutions that are making a difference against all odds. Thank you, Dr Pavitra Mohan and Dr Sanjana Mohan. Your dedication is heartwarming and you inspire me.

Arvind Singhal

Thanks for Jagdeep Chhokar's article, 'We, the warriors of democracy'. Voters owe a lot to Association for Democratic Reforms (ADR). They have quietly, without fanfare and with

great courage, tried to improve the sum and substance of Indian democracy. ADR gives us valuable information about candidates before every election.

It also flags serious issues facing democracy, like electoral bonds, and dissects data for us. It is a more trusted source than most of the media.

Ritesh

Laws by people

As you write in your article, 'The joy of joining the dots', India has a robust civil society with a law like Right to Information and a whistleblower one as well.

The country needs to add an Open Meetings Act, which will bring sunshine and transparency to governance at all levels. I really like

your philosophy and look forward to your articles.

Porus Dadabhoy

Genius farmer

Thanks, Shree Padre, for the story, 'Saffron blooms in the south'. Girish Ramaswamy has shown through his determination that in the right environment one can grow any crop anywhere, anytime.

Hiraman

Much appreciated. Girish Ramaswamy has made a very good effort in growing saffron in Karnataka. My only request is that he should distinguish his saffron from the Kashmiri one so that small farmers in Kashmir can retain their geographical indication and identity.

Anil Gupta

Travellers' tale

Susheela Nair's article, 'Wondrous stepwell and a love story in Adalaj' was a really nice article. I enjoyed reading her vivid description with its good mixture of history and architecture. Expecting many more such articles in future!

Parvathi Dad

Thank you for this article on the Adalaj stepwell. It is an architectural wonder. Really amazing descriptions. More pictures would have been appreciated.

Nalini Krishnankutty

Your article makes very absorbing reading. One day I will go there, witness the architecture and relive the tragic love story of the Vaghela queen!

Sudhir Ramchandran

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COVER STORY

REINVENTING HEALTHCARE

Inclusive innovations are changing healthcare. A hospital bed becomes an ICU bed in minutes. Put an ECG machine in your pocket. A handheld scan is accurate in identifying oral cancer.

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Civil Society Public Health Initiative

THE pandemic is a reminder of the need to quickly strengthen our public healthcare system. An elaborate structure exists and it needs to be brought back to life through a national effort. The question is how can this process begin at an accelerated pace.

The government, both at the Centre and in the states, has the most important role to play. It has to make investments, define deliverables and set standards. Millions of poor and uneducated people wait to be dependably served. Only the government can provide them healthcare which is accessible, affordable and inclusive. It also has to create the contexts in which doctors are encouraged to be guided by the values of their profession and a spirit of service.

There is much to be learned and gained from the examples set by public-spirited outliers whose initiatives have benefited people in far-flung corners of the country. Physicians and surgeons with the best of degrees have moved out of cities to dedicate themselves to working for the rural poor. They have set up hospitals and clinics to serve remote communities which would otherwise have no access to quality care.

Covering healthcare in the past 18 years in this magazine, we looked for and found such outliers both in the government and voluntary sectors. At a personal level their stories are inspirational. In their work and the challenges that they overcome can be found multiple solutions to delivering better healthcare across the country.

Their examples are a reminder that a national effort in healthcare should be diligent in recognizing local needs and resources. A centrally nurtured but distributed model is what is required.

Much is, however, to be gained through cross-learning and sharing of experience. It is to this end that we have created the Civil Society Public Health Initiative. We intend to make the connections that will enrich policy and create wider awareness of healthcare realities.

Meeting and listening to these doctors will take them out of their isolation. While many of them are part of government programmes at the local level, they don't get the recognition and understanding that could be transformative. Their approach to healthcare and their values should be espoused as the standard society generally aspires to.

Parallely, we have found technology playing an important role in making healthcare available to large numbers of people quickly and cheaply. Telemedicine is invaluable.

But devices that speed up diagnosis and treatment are now breaking new ground. Dr Raghunath Mashelkar calls this 'inclusive innovation' in this month's cover article. Science and technology are used to serve a larger social good.

Many of these devices are born of personal experience. We believe we are witnessing a growing trend of qualified Indians dedicating themselves to nation-building by solving the problems of development.

Umesh Anand

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R. Balasubramaniam: 'We would like to set benchmarks of performance and enhance e-learning resources'

'We are mapping officers for competence and capacity'

R. Balasubramaniam on improving governance

Civil Society News
Gurugram

THE Government of India is a leviathan and bureaucrats are widely accused of being mired in procedures. They are also seen as obsessed with their own powers. Instead of facilitating development they tend to slow it down. How can they be made more accountable and action-oriented? Can they go from salaried *karamcharis* to role-driven *karmayogis*?

An elaborate exercise driven by Prime Minister Narendra Modi himself is underway to change the way the bureaucracy performs. The Capacity Building Commission (CBC) has been set up. Its job is to map officers and put in place processes for assessing them. Designing online training modules is a part of the commission's brief. An officer who goes from aviation to health or education should have a basic knowledge of the new subject he will be dealing with.

R. Balasubramaniam is member, human resources in the commission. *Civil Society* spoke to him about the momentous task ahead.

What is capacity building in the Government of India (GoI) actually going to mean?

Around two years ago, the Prime Minister conceived of Mission Karmayogi. Essentially, the mission redefines how public servants think and feel about their role in the government. The idea is that government servants should see themselves not as salaried employees or *karamcharis*, but as *karmayogis* or people imbued with the spirit of action and service.

Mission Karmayogi is overseen by the Prime Minister's Human Resource Council (HRC). The heart and soul of Mission Karmayogi is the Capacity Building Commission. Our primary mandate, in the words of the Prime Minister, is to get people in government to move away from a narrow, rule-based approach and instead see themselves as

performing a 'role of service' to citizens. So, it is about shifting them from rule-based thinking to role-based thinking.

If we talk of a new India, we need capacity in the system to deliver. It is necessary, therefore, to get the bureaucracy future-ready.

I think COVID-19 was a wake-up call. The public sector got redefined. The way you understood public goods got redefined. Was the vaccine to be given free or paid for? Everything got redefined.

And the State understood that its role was no longer about just delivering goods and services, but also about enabling citizens to receive those goods and services. Boundaries between the public sector, private sector and civil society got blurred.

India achieved independence in 1947 and the Indian civil services inherited a colonial mindset. They saw citizens as just subjects. But I think from the 1950s there was this feeling of being a provider. From bakeries to running airports, the State did simply everything. Then, in the 1990s came

privatization and liberalization and the State had to have a vision for development and not just provide for it. And today, the PM talks of *jan bhagidari*, which means partnership with citizens. That requires a levelling of power and accepting citizens as equals.

Capacity building is a combination of all this. It means shifting the mindset of civil servants from being rule-based to role-based and giving them the skills to deal with the new demands being made of the bureaucracy by citizens. It also means appreciating the need to look at citizens as equal partners and taking them along on the journey of development. It is a completely new ballgame.

How many members are there in the commission?

It's a three-member commission. The government has conceived of its membership in a very interesting way. My colleague, Praveen Pardeshi, is a 1985-batch IAS officer. I come from civil society and academia. We are both full-time members. Our chairperson is Adil Zainulbhai, who is from the private sector and was earlier chairman of McKinsey in India. He brings in the private sector way of thinking.

It's a very unusual combination and reflects the evolution of public services. The intent of the government and the Prime Minister is to get the best out of different ways of thinking and make that amalgamation work for the State and benefit its citizens.

Will you be looking at people across the board or only those employed by the central ministries? Do you include the states?

Technically, our mandate is only for the GoI and all categories of officers in Groups A, B and C. There are only 30,000 Group A officers across the country. There are Groups B and C, which are hardly noticed, but where the bulk of the work is done. We are looking at 3.1 million people right now and it is a huge number. Whatever material we put together is available to the entire country. If the states want to use it, they are more than welcome.

How are you going to feed this into the system? How will people use it? What kind of material will it be?

We have mapped the supply side. We know that there are 800 institutions, which include the LBSNAA (Lal Bahadur Shastri National Academy of Administration) for the IAS and the Police Academy, amongst others. Every ministry has got its own training institutions. We want to build the capacity of the supply side. We would like to set benchmarks of performance and enhance e-learning resources.

The government has recently created an exclusive digital learning platform. It's called Integrated Government Online Training or iGOT. It is a Section 8 company under which the GoI will own all the digital assets that are created. The material will be curated and overseen by the commission, and we'll make sure that all material on building capacities will be available online. It will be a platform where anytime, anywhere and any device learning can happen.

We don't want an officer to take time off from work and go for training. Officers should be able to access the material required based on need.

We are making sure that the material is in small bites of three to five minutes. You will be able to

watch the video or hear the audio file or read the material — all within this short time frame. The iGOT platform offers a single source destination for all the components we will need and require online.

On the demand side we are mapping people's competencies. We will be doing an HR audit of all the 93 ministries in the GoI to know how many people there are, their roles, how they are performing and what they are supposed to be doing given the goal of the ministry.

Take the example of the civil aviation ministry. Civil aviation is a fascinating combination of so many different skill sets. You need people who understand citizen-centric services and then you need to have the capacity to be regulatory in the way the DGCA (Directorate General of Civil Aviation) functions. You have an Airport Authority of India to look at the facilities that citizens get. Until recently, they also needed to know how to run an airline.

We map the mandate of the ministry and align it to national aspirations and then we ask ourselves whether the team in the ministry has the competency to deliver on this mandate.

We look at competency on three levels. The first is the behavioural attitude to serve, which is the most critical. Then we ask ourselves, does this person have the functional competency to play this role? Let's say, does a section officer in the ministry understand what is expected of a section officer?

'Capacity building means shifting the mindset of civil servants from being rule-based to role-based and giving them the skills to deal with the new demands being made by citizens.'

Does he or she have the capacity and the competencies for it? To find this competency we map people and performance.

Then we ask ourselves, if I am in civil aviation, do I have a domain understanding of civil aviation. So we train them in civil aviation. Let's say tomorrow I get transferred to the health ministry. I must still be a section officer, so my functional competencies are okay, I'm still inspired to serve, but I have no idea about the health sector. So, to such a person, we say that you can take charge only after you take these core courses. Prepare yourself, learn about the health ministry and then take up the job.

Our job is to map these competencies, map deficiencies and then provide a pathway to fill the gaps in, say, a year's time. We provide the source from where you can acquire competency — it could be in a training institution or on the iGOT platform, whenever you can. But there is a cut-off date for you to acquire this competency.

We expect to get to every single ministry within the next three months or so. We will provide them with an annual capacity building plan, which we oversee and monitor to make sure their capacities are built, and this is going to be an ongoing feature.

The commission will be constantly overseeing what kind of capacities government officials need and how to give it to them. We will be constantly iterating it against the system demand.

Every year, we're going to map and track the trajectory of growth in competency building. The commission reports to the Prime Minister and his

HR Council. I think the system understands that this is a very important area for the government in delivering to citizens.

The President of India, in his address to the joint session of Parliament, specifically mentioned the commission as a critical entity. And the finance minister, in her budget speech, mentioned how we're working to support different ministries in ensuring the national infrastructure pipeline project succeeds. If this commission's work evolves and grows the way it is happening now, in two or three years it could be a game changer for India's public administration and, therefore, public delivery of goods and services to our citizens.

So, no government official will be nameless or faceless. Will you also be looking at the processes which they use?

The moment we say capacity, we look at it from the level of the individual, the ministry or department and the government. What will 'work' mean three years from now? What will the government look like? The Prime Minister keeps stressing 'maximum governance and minimum government'.

How do you deconstruct that statement? What will government look like one year from today or two or three years from today? So, we are constantly mapping and defining the meaning of work. To deliver this work what is the 'workplace' looking

like? And there we look at policies, rules, regulations. It is also part of our mandate to do HR audits and mapping and we are going to do it soon.

Nobody's asked government officials what it means to work in government. What does the workplace mean and what's coming in the way of delivery? How does he or she perform the assigned role in a facilitatory, process-driven manner?

What about recognition? Officials feel they don't get any recognition even if they do good work.

Just a few days ago, we launched a national portal on innovation in public administration. We are saying, we would like to know what you are doing. It could be anything, a small innovation or a major one. We want to celebrate them as heroes to make sure that they're actually heard and seen.

Our annual report will have a dedicated chapter on innovations in public administration. The best ones may get picked to be reported. Second, we are going to create a knowledge repository. Personally, as an academic, I feel it is inappropriate that we teach cases which aren't in the Indian context.

We are creating a repository of India-specific cases which our own officials, in their own small ways, have achieved. We're building a case bank of all success stories. The examples we are interested in should not be more than five years old, scalable, measurable and citizen-centric. I am putting all my academic experience and knowledge from Harvard and Cornell into building knowledge partnerships with top institutions to support us. ■



Atop a tree: Coconut harvesters are mostly between 20 and 30 years old

Jobs grow on coconut trees

How Kerala makes Chhattisgarh richer

Shree Padre
Thiruvananthapuram

NINE years ago, when 57-year-old Pushpangadan Mohandas, an ex-serviceman, went in search of a coconut tree climber, he couldn't find anyone. Finally, he bought a device and climbed his own tree to harvest his coconuts. Once up, he found it tough to come down. It took him an hour to figure it out. But the experience taught him a valuable lesson. Kerala, the land of coconuts, was suffering from a serious shortage of climbers. Here lay a business opportunity.

Mohandas converted his company, Computech, which used to teach computer education, into a coconut harvesting company. People are trained to climb coconut trees and then put on the job.

What is unusual about his company? Well, all his climbers are from distant Chhattisgarh. None had seen a coconut tree until arrival in Kerala. Not a single person from Kerala has applied for a job with Mohandas' company.

The coconut tree climbers from Chhattisgarh have earned a reputation for professionalism. They turn up on time, bring down the coconuts safely, ensuring nobody's head or tiled roof gets damaged, and they charge just ₹50 per tree.

"Local harvesters have to be called 10 times

before they turn up. Then they charge extra for crown cleaning, pesticide application, and demand up to ₹125 per tree. But with Computech, things are different. One call is enough. I have recommended them to many of my neighbours. Their harvesters have a positive attitude," says Peroorkada Narayanan, owner of 22 coconut trees, approvingly.

Today, about 46,000 families in Thiruvananthapuram depend on Computech to harvest their coconuts. Located in Ayiroorppara, a suburb, the company now has eight branches across the city.

The coconut tree climbers or harvesters are mostly between 20 and 30 years old. Most have completed a school education. Each earns between ₹25,000 and ₹40,000 per month. When they go back to Chhattisgarh after six months or so, they take with them around ₹2 lakh each. Those who stay for a year save, on average, ₹4 lakh.

"For young men in Chhattisgarh, joining our company is like going to the Gulf for Keralites," says Mohandas. "Their first priority is to buy a motorcycle. Many of them do so within six months of joining us. In fact, if you hear a motorcycle rumbling past in a village in Chhattisgarh it may very well be a member of our staff. They have also constructed concrete houses with their earnings."

The company now has a staff strength of around

100 people and attrition rates are low. But when Mohandas started, he found it tough to attract workers to his unusual venture.

SHAKY START

Back in 2013, when Mohandas decided to convert Computech into a coconut harvesting set-up, he thought the best way to begin would be by training newcomers. Early one morning, he drove to Pothencode junction where hundreds of migrant labour from north India gather at 4 am, waiting for building contractors to come with trucks and pick them up.

As soon as Mohandas arrived, workers milled around his car. What was the work, they asked. How many labourers do you want? Mohandas explained that he was looking for people he could train to do a different kind of job. If they learnt, they could earn as much as ₹1,500 per day. Eight interested workers piled into his car.

Mohandas took them to his home-office and explained the job. He showed them a video and started training them to climb a coconut tree. After half an hour, they said they couldn't do it and please could he drop them back.

Mohandas' attempt to find workers was futile the next day as well. On the third day, labourers warned other labourers not to go with him. "It's a waste of



Pushpangadan Mohandas training his workers



The busy call centre

time," they said.

So, Mohandas looked for another labour pick-up spot. There, too, for six days he couldn't attract any workers. Finally, a labourer from Chhattisgarh, desperate for work, said, "If you give me a basic place to sleep, I'll do whatever you tell me to." His name was Ramesh and he became Computech's first coconut tree climber. Mohandas trained him and in a few hours Ramesh was able to harvest nuts from nine coconut trees. He worked five years for the company.

Another five workers from Chhattisgarh then joined Computech. Initially, Mohandas would take them in his car and climb coconut trees with them, alongside. The reason was that none of his workers knew Malayalam and customers found it difficult to communicate with them. Also, since they were unfamiliar with the city, they found it difficult to locate the addresses of clients. Subsequently, Mohandas bought bicycles for all of them.

These workers returned to their villages and came back with friends and relatives who wanted to become coconut harvesters. That also filled Mohandas with confidence. He realized he was on the right track.

"Coconut harvesting is a tough job," he says. "But

Photos: Civil Society/Biju Karakkonam



Selfie with coconuts

Otherwise, it is fixed for the next day. There is no delay," says Meena, a call centre staffer.

Computech has also developed a 'workers app'. Once the call centre at Ayiroorppara receives a booking, it passes it on to the harvester on his mobile. If the harvester has chosen not to work on that day he simply has to press a 'no' button. There is no compulsion. If he has completed his work, he can ask for more assignments which fall on his route home.

Office hours are from 7 am to 6 pm. "We work even during the rainy season. If it rains during work, no issues. But if it rains at the start of a working day, that becomes a deterrent," says Mohandas.

"We don't ignore a request even if it is from the owner of one tree. In fact, we give them priority. If a customer wants the harvester to come on a holiday, we organize it. The customer's convenience is always honoured."

Each branch has a manager and a supervisor selected from amongst the workers. The manager sees to it that processes run smoothly and the supervisor is in charge of collecting and disbursing money.

Earlier, employees used to assemble at Computech's office in Ayiroorppara and then travel all over the city, sometimes going 25 to 30 km. In 2017, to reduce their daily footprint, the company began opening branches. Now harvesters have to travel upto a radius of just five to 10 km.

"If conditions are favourable, they harvest 100 trees a day on average. If they have to visit two or three sites, this number falls to 60 to 80. Some call it a day around 3 pm. Others go on working till 5 pm," says Mohandas.

Out of ₹50 per tree charged, the company gives the climber ₹32. "We disburse about ₹12 lakh to our harvesters every month," says Mohandas.

FROM NORTH TO SOUTH

In Chhattisgarh the daily wage in rural areas is a paltry ₹150 to ₹200 per day. Mohandas, who has visited some of his workers' villages to attend weddings or to meet them, says he was surprised to see people still living in thatched houses. The boys generally go home for weddings or during the

Continued on page 10

Mohandas went from computer education to coconuts. People who want coconuts harvested now just call Computech for trained climbers.

these boys from Chhattisgarh carry it out efficiently. They pedal nearly 25 km daily."

CALLING A CLIMBER

To spread awareness about the company's services among the residents of Thiruvananthapuram, Mohandas advertised on FM radio and on hoardings and banners.

Computech now has a call centre manned by 11 women who take down the caller's details and insert them in the database. "We have the route map of each harvester in front of us. If his schedule isn't full, the job is allotted to him immediately.

Continued from page 9

monsoon to cultivate their lands. They return after two or three months.

Shyam Singh, 29, joined Computech a year ago. His elder brother, Shripal Singh, has been working for the company for five years. It took Shyam six days to learn to climb the trees. Now he harvests nuts from 30 to 40 trees per day. His monthly income is ₹25,000.

Shyam Singh comes from a village in Ratanpur district of Chhattisgarh. His is a joint family of a dozen members. They own nine acres, some of which has been mortgaged to borrow money. He says his monthly expense on food is ₹2,000 and he is saving the rest. His family back home is constructing a six-room building which they hope to lease out for commercial purposes.

The elder brother, 41-year-old Shripal Singh Paikra, has studied upto Class 8. Earlier, he worked in Delhi as a coal loader, earning ₹8,000 per month. He now earns ₹30,000. Last year, he spent ₹6 lakh to build a new home. He has brought nearly 12 youngsters from his village to work for the company. "I can't dream of earning such an income back home. In fact, I don't feel like going back at all. I'll work here as long as I can," he says.

Shripal and a friend have brought their wives to Thiruvananthapuram. They are living together in a rented house in a nearby area. Computech provides free accommodation to single workers.

"At first, locating the homes of customers was difficult for us. But now I know every nook and cranny of Thiruvananthapuram," says 33-year-old Shiv Narayan Marani. He has studied upto Class 10 and has worked for Computech for five years. He harvests, on average, 85 trees a day and earns ₹35,000 per month.

"Everything is just fine here. I don't know how time passes," he says. "After working for six or seven months I will go home to help with cultivation and then I'll return. Back home, my status has gone up." Marani has built a new home for ₹8 lakh. He has brought five members of his family to work for Computech.

Initially, the problem Computech faced was that harvesters would leave the job after two or three months. "The company wasn't getting any benefit after training them. So, for recruits we have a new rule. They get half their pay for the probation period of six months. After that they can take their full pay," says Mohandas. In nine years the company must have trained about 500 coconut tree climbers.

Some years ago, Computech faced an unexpected crisis. A lady staffer left her job and took several harvesters with her. Computech then faced an acute shortage of manpower. Recruiting and training newcomers takes time and effort. Mohandas didn't despair and instead travelled to Chhattisgarh.

He went to the villages his recruits came from. He spoke to families and got a positive response. A group of youngsters boarded the train to Thiruvananthapuram to work for him. His staff strength was restored. He also publicized his job offer in the villages.

Noting Mohandas' success, a few more coconut harvesting set-ups have sprung up but none can match Computech in efficiency and service. His outfit is a model for south Indian states which have coconuts languishing on tree tops. ■

Computech: 70255 46660 (7am - 6pm)



The Neev Woodworks team: Anurag Jain with Anjali and Tanupriya at their workshop

'Wood is divine, I like being a craftsman'

Eco-friendly furniture from a new micro enterprise

Civil Society News
Gurugram

A tree lives on as wood in the hands of a skilled craftsman, becoming a thing of beauty and a joy forever. Ask Anurag Jain, who makes minimalist furniture from recycled pine. Woodwork is worship for him.

"You know, from cradle to grave we use wood. It's intrinsic to our lives and so sustainable. Is there anything you can't make with wood?" muses Jain. Sitting in his 15 feet by 18 feet workshop, he has a line of neatly made wooden cabinets visible behind him.

Jain, 47, is well-known as the founder of Neev Herbal Handmade Soaps, a social enterprise which he started with ex-wife Shikha in Hurlung village in East Singhbhum district near Jamshedpur in 2007. The business did remarkably well and won several awards for the purity and gentleness of its soaps. It succeeded in commercial terms, too, reaching a turnover of ₹2 crore.

"That is a pretty good turnover considering the business is run from a village," says Jain.

Post his divorce, Neev Soaps is run by his ex-wife. Jain realized he'd have to think of an alternative livelihood. An admirer and follower of J.D. Krishnamurti, Jain was teaching Advaita Vedanta at Neev Trust's Centre for

Self-Inquiry. But the centre was short of funds and needed an income-generating activity.

So, in October last year, Jain registered a small business — Neev Woodworks which is also located in Hurlung village.

"I like working with wood. I was always fascinated by its qualities and versatility, the amazing variety of wood available, its grains, its behaviour," says Jain, clearly passionate about his new vocation.

Jain is a self-taught wood worker. Circumstances were such. Every time he'd call a carpenter to repair something at home, the man would either not turn up or do a bad job so he decided to learn how to fix things himself.

After registering and getting his GST number, Jain got a workshop going with the equipment he needed. He hired an enthusiastic intern, 23-year-old Anjali Kumari. Subsequently, her sister, 21-year-old Tanupriya Kumari, joined them. Jain taught the two of them wood work and five months

later they are adept carpenters, probably the only female carpenters in all of Jharkhand.

The small team does everything, from buying wood to designing, cutting, pounding, polishing, artwork as well as marketing. As with his handmade soaps, this time, too, Jain is ensuring that his enterprise is green and environmentally sustainable.



furniture but only for local clients.

"I love craftsmanship. I am not for mass production," he says.

The designs are inventive. Jain was approached to design a self-watering pot for an enterprise called First Leaf, which grows and sells micro greens in Delhi. After some thought, he came up with a planter with two boxes. A small earthen pot can be placed in the lower box with a jute thread going up to the box above which is filled with soil. The jute thread takes water from the lower box to the upper one. "It looks really pretty when it's filled with micro greens," says Jain. This product is likely to be priced at ₹500.

There is also an attractive window made wholly of wood which Jain is proud of. "The entire window frame is made with wood. Even the slider isn't made

of aluminium but wood," he says. There's also a solid wood door with a smart design redolent of the old doors of the 1960s. A machine for his workshop which would have cost him ₹1 lakh has been designed by him for ₹10,000, saving costs.

There is also a jewellery box and coasters painted with contemporary designs by Tanupriya. There are lampshades in pine wood designed such that the bulb radiates a burst of light.

"It's easy to do this work because of the tools we use here. I studied commerce and I was doing my bachelor's in business administration. I wasn't sure what I would do after studying. Should I opt for a bank job? This new business looked more interesting," says Anjali. "I like making utility items and my sister prefers painting and design work." There are storage boxes with wheels, dustpans, tables, chairs — all newly made.

The items are neat, eco-friendly and eye-catching as well. Ironically, Jain never went to design school. He studied civil engineering at the Regional Engineering College in Kurukshetra, worked for L&T, became a social entrepreneur, a teacher and is now a craftsman and entrepreneur, once again. ■





The Ghazipur mountain of garbage

Photos: Civil Society/Ajit Krishna

Getting rid of a garbage mountain

Sort, burn, recycle, bury — it takes years

Civil Society News

New Delhi

A mountain of garbage, now 65 metres high and roughly as tall as the Qutub Minar, looms as a major civic embarrassment over Delhi.

Located at the Ghazipur landfill in the frayed eastern fringes of the capital, the garbage mountain has been in the making over the past three decades.

Getting rid of this fetid legacy now could take as long as 10 years — and that, too, if there is an innovative and well-managed effort led by the state government and municipal authorities.

Some efforts are underway, but in the meantime new waste is also being dumped around the mountain. There are an estimated 2,000 tonnes turning up every day at Ghazipur from within the east Delhi area. So, even if the mountain is got rid of, it will not necessarily mean the end of the dump.

A garbage mountain festering in full view is a major embarrassment for a capital city. But Delhi, like almost all other Indian cities, shoves its solid waste out of sight only to find itself in its menacing shadow over time. Apart from Ghazipur there are two other overflowing landfills at Okhla and Bhalasawa. Delhi generates about 12,000 tonnes of



Raj Kumar of Zonta Infratech

garbage per day.

When the Test cricketer, Gautam Gambhir, got elected to Parliament from the East Delhi seat as a BJP candidate in 2019, one of the promises he made was that the mess at Ghazipur (it falls in his constituency) would be cleaned up by the end of 2024, when his term ends and he would need to stand for election again.

It is not going to be easily done. If election promises could make garbage disappear, India's cities would be much cleaner. A whole lot more is needed.

To be fair to Gambhir, he has acted. The East Delhi Municipal Corporation (EDMC), which is run by the BJP, has been mining the garbage at Ghazipur. In fact, Gambhir claims the height of the mountain has come down by a few feet or so. But much hard work lies ahead.

How can a garbage mountain be removed? It is a managerial challenge, we are told by Raj Kumar, MD and CEO of Zonta Infratech, a company that provides consultancy and systems for waste management to cities.

A city government which wants to seriously deal with its waste must be prepared to introduce innovative policies and take entrepreneurial decisions. It must be ready to build a system in which the garbage problem is addressed in homes and commercial establishments with segregation of biodegradable and recyclable waste.

How soon a mountain of legacy garbage can be made to vanish will depend on a government's savvy. Garbage can be incinerated, turned into biogas, recycled and buried.

To exercise such options several moves have to be made. Among them is the incentivizing of large industrial users to put the garbage to alternative use such as burning it for energy.

"Before biomining waste, you have to decide what you want to do with it," says Kumar, who has been involved in getting rid of garbage mountains in Tirunelveli and Jabalpur. He has also been looking at best practices all over the world.

"The term 'mining' in itself implies that there is a raw material. The question is who has use for it? To which industry should it go?" he explains.

One big user of garbage is the cement industry where the garbage becomes RDF or refuse derived fuel. Garbage in Ghazipur could end up in the clinkers of cement factories where it would be burnt for energy.

But cement plants are not necessarily located close to garbage dumps and certainly not the one at Ghazipur. There would be transportation costs in sending the garbage to distant factories which the government would have to bear. Then again, cement factories need garbage in which the moisture is within certain limits.

One cannot also depend entirely on the cement industry. It is necessary to have other options. For instance, waste-to-energy plants can be relied upon to be large and continuous consumers of garbage.

The EDMC's initiative in Ghazipur could do with a more robust and realistic strategy for reducing a garbage mountain of the size that exists there. It needs bigger consumers with incentives thrown in so that not only does the mountain come down quickly but the daily addition of 2,000 tonnes or so is dealt with.

Currently, about 15 percent of the waste mined in Ghazipur is sent to waste-to-energy plants located there. Around 20 percent is used for making bricks and tiles at the construction and demolition plants of the EDMC. Good earth from the dump, which accounts for 50 percent of the waste, goes to the National Thermal Power Corporation (NTPC)'s eco-park in Delhi and the EDMC's parks. The EDMC is reportedly mining 3,000 tonnes a day.

Delhi has three waste-to-energy plants. It is hardly enough. In fact, India on the whole has five

plants and with those that are coming up the number could be eight or nine.

In India these plants are mired in controversy. Governments have problems finding locations for them because of objections raised by local communities. There are also activists who have taken up cudgels against them, denouncing them as

IN TIRUNELVELI...
This was a garbage dump before it was capped and greened



polluting. One view is that the composition of Indian garbage is not suitable for incineration.

Not everyone would agree. Kumar points out that China has around 500 waste-to-energy plants running successfully. The parallel is important because the composition of China's waste is not dissimilar from waste in India.

In fact, the world over, cities that have cleaned up

their waste have relied on turning it into energy. Pollution from their plants has been neutralized through the use of better technologies.

Biomining of garbage is done using large trommels to which there are magnetic attachments and screens and sieves. Depending on the nature of the waste it can be put to different uses.

There are three or four categories of waste. The first is the kind that can be incinerated. It can provide refuse derived fuel and can go into the clinkers of cement factories or can be used in waste-to-power plants.

The second is good earth, soil or sand which can be used for filling low-lying areas or during road-making. A third fraction consists of rocks, small stones and dust which have no uses and can be put back in the landfill and capped. A fourth could be metals and perhaps also batteries and e-waste which can go to recyclers.

Waste management requires political will, municipal vision, technological awareness and business sense. It is complex and what the garbage mountain at Ghazipur needs is a special purpose vehicle (SPV) that can rapidly come up with a range of viable solutions.

A model worth examining is the one that was followed by Jabalpur in Madhya Pradesh some years ago for which Kumar's company provided consultancy.

An active and aggressive municipal administration in Jabalpur first set up a waste-to-energy plant and then started mining the garbage.

It is a good way to go except that when the legacy waste was taken care of in Jabalpur, there wasn't enough waste coming in from the city to keep the plant running.

When legacy waste had to be dealt with in Tirunelveli, it was merely capped and the surface greened, recalls Kumar. But in 2016, the government's rules on waste management changed and biomining was introduced.

Reuse of waste after mining it from a dump makes waste management a balancing act more complex than ever before. Technology and business realities have to be taken into account. The participation of citizens is also important. Everything has to hang together in a calibrated effort if cities are to be cleaned up quickly. ■

Samita's World

by SAMITA RATHOR



Training the homeless

Surmayi Khatana
New Delhi

FIFTY-year-old Dileep Kumar Gaurav from Uttar Pradesh was a practising lawyer handling criminal cases for a decade. He has a law degree from Dr Bhimrao Ambedkar University in Agra and worked on cases pertaining to dowry, theft and sexual harassment.

But a feud with his brother led to him becoming homeless. "My elder brother is a civil engineer. He and I got into multiple fights which finally ended in my leaving home without property or any possessions. I feel totally cheated by my brother."

He found himself on the streets of Delhi without money, a roof over his head or a job. Gaurav began working as a manual labourer, alternating between Hanuman Mandir and a nearby gurudwara for food.

He is one of 25 people being trained in painting walls as part of a pilot project by the Delhi government to rehabilitate people living by begging.

The project was piloted on November 1 last year by the Delhi government at a Delhi Urban Shelter Improvement Board (DUSIB) shelter for the homeless on Roshanara Road, after an on-ground survey by the Department of Social Welfare and the Institute for Human Development identified 20,719 individuals engaged in begging in the capital. Out of the total, 53 percent were men, 46 percent were women and one percent were transgender. The highest number of beggars — 2,797 — were found in East Delhi.

"We identified 30 people engaged in begging from different parts of Delhi, mobilized them and took them to our shelter and training centre," says Sanjay Kumar, co-founder of Aashray Adhikar Abhiyan (AAA), the NGO partnering the Delhi government in this project. Five beggars dropped out, so AAA trained the remaining 25.

The NGO runs 12 homeless shelters across New Delhi and has been working for the rights of homeless people since 2000.

The project includes training in language, basic skills, vocational training and setting up routines for the trainees. When many of the participants expressed interest in learning painting, a training programme in wall painting and house painting was added.

The DUSIB shelter at Roshanara Road is at the end of a short lane and has colourful walls with trees and birds painted in purple and yellow by the trainees. The shelter has a library on one side of an open verandah with books in Punjabi, Urdu, Hindi and English. Training sessions take place opposite the library.

The day starts for the trainees with yoga in the mornings, followed by breakfast. Training begins from 11 am onwards. The participants don white coats and hair nets and learn the techniques of painting. They practise using paint rollers, brushes,



Learning to paint walls

The Delhi government is training destitute and homeless people to give them skills so that they can make a living and get off the streets of the city.

and masking tapes on the walls of the shelter. The trainees are mostly between 25 and 35 years old and all of them are men.



Dileep Kumar Gaurav

The project includes daily counselling and therapy. "Losing your social position is tough," says Sanjay Kumar. "We help them regain their sense of dignity with patience and heart."

The project lasts three months. Each trainee is given a certificate after completing the course. Some have already found employment.

Gaurav says the training has transformed him and has filled him with hope. "As Martin Luther King said, we shall overcome," he says. He

talks about Socrates and lists legal acts and sections from memory while recounting the cases he worked on in the past. He says he now feels like his old self and thanks the trainers for it. "It feels like I had gone rusty and now I have been polished," says Gaurav.

He was sceptical of the project when he was first brought to the shelter and unsure about why he was being offered a place to stay and food to eat. But after a few days of interaction he warmed to the trainers. He enjoyed the training in painting and feels excited about his recent projects.

"I am being paid somewhere around ₹500 to ₹800 for a couple of hours' work right now," he says. He expects that figure to increase to ₹1,500 once he completes the advanced training. He wants to train other people who come to the shelter. "I can teach five more people," he says.

As part of the project, trainees have been helped to acquire voter IDs and Aadhaar cards and open bank accounts. The aim is to help participants become financially independent and self-sufficient.

Sanjay Kumar Kushwaha, 25, is one of the youngest trainees at the shelter. He is from Rewa in Madhya Pradesh. All his possessions were stolen at New Delhi railway station when he arrived, looking for employment. He did some manual labour around Hanuman Mandir but was unable to find much work due to lack of documents. He also had nowhere to live.

But on the day we meet Kushwaha, he is cheerful after having sent ₹10,000 home to his family. This is money he has earned from wall painting and his work as a confectioner. He points to the walls he has painted within the shelter. He has more projects lined up. "I did some house painting locally in Delhi, and travelled to make some sweets in UP. Next week I have more walls to paint in Delhi. I travel by the Metro to get there," he says.

He was able to reconnect with his parents and sister after his trainers helped him get a SIM card. He has recently purchased a phone.

The Ministry of Social Justice and Empowerment has identified 10 cities — Ahmedabad, Bengaluru, Chennai, Delhi, Hyderabad, Indore, Lucknow, Mumbai, Nagpur and Patna for undertaking pilot projects on the rehabilitation of people engaged in begging.

The shelters and the success of the pilot project have drawn attention with visits and meetings by representatives from the central government, and officials from Bihar and Tamil Nadu. "It is a replicable model if done with genuine care, and it is also scalable," says Sanjay Kumar. ■

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Reinventing healthcare

Trailblazers with inclusive innovations



By Raghunath Mashelkar

A major outbreak of dengue fever in India in 2013 resulted in a flood of patients at hospitals and clinics across the country. As their numbers soared, test kits for quickly identifying dengue so as to begin treatment early went out of stock.

The test kits were imported and though an order had been placed with a South Korean firm to replenish them, the consignment was sent to Africa instead by mistake!

Attention then shifted to a test invented by Indian scientists. It had for long been overlooked in favour of the imported tests which were widely used and dominated the market.

The Indian test was called Dengue Day 1 because it could detect dengue within minutes on the first day of the fever. It could also differentiate between primary and secondary dengue virus infections, which is vital for the clinical management of a patient. The test could also detect the presence of the virus in the Aedes mosquito.

Importantly, it was three to four times cheaper than the conventional test and could be used in resource-poor settings. In other words, it could be easily used in villages and small towns where health infrastructure was inadequate.

All in all, Dengue Day 1 was a much better option than the imported tests which had been in use. But it wasn't a trusted product because it had been invented in India and not abroad. It, therefore, had little or no presence at all in the Indian public healthcare system despite its many advantages.

But during the 2013 outbreak, there was a huge unmet demand for test kits. There was also no other option since the imported tests were out of stock. And Dengue Day 1 finally got the attention it deserved and was widely employed.

From being ignored, Dengue Day 1 went on to capture 75 percent of the Indian market because it was cheaper, superior and better suited to Indian conditions. Since then, it has been used for doing 10 million tests. Other countries have begun importing it.

The Dengue Day 1 test is a great example of 'inclusive innovation', a cause I have been passionately championing. Simply put, inclusive innovation makes high technology affordable and leverages it for the poor, especially in rural areas where health facilities are sorely lacking.

Vast numbers of Indians continue to be poor. Around 70 percent of the population lives in rural areas but they don't have access to even 30 percent of the nation's health infrastructure. Just three percent of Indian doctors are located in rural areas and the doctor-patient ratio is 1:2,000. There are merely eight hospital beds for a population of 10,000 whereas China, by comparison, has 40 for the same number of people. There should be 44 health workers per 10,000 of population, but India has only 22.

These and other similarly depressing figures are well known. They tell a story of extreme neglect of public healthcare systems. The question is how to quickly improve medical facilities and provide easy and equal access to them so as to build a healthy nation even as roads, power lines and the internet reach remote corners of India.

Providing health facilities and putting in place more doctors, nurses and health workers will take time and investments. There is also a complex management problem to contend with. Both the central and state governments have generally sound public healthcare policies. The healthcare system is well structured, from small sub-centres to primary health centres and secondary and tertiary hospitals. But the system lacks sophistication and doesn't deliver uniform results.

Until the system is made more efficient, can 'inclusive innovation' be used to leapfrog to higher standards of healthcare? Can we simultaneously pursue 'affordable excellence' through technological innovations which give the poor



Dr Navin Khanna with his Dengue Day 1 test

Inclusive innovation is a cause I have been championing. Can it be used to raise the standard of healthcare for the poor even as we go about adding doctors and nurses and improving the system?

the highest quality of healthcare?

Can we do it? Generally, what is affordable is not excellent and what is excellent is not affordable. This is where inclusive innovation becomes important — getting more (performance) by using less (resources) for more (people). More from less for more (MLM).

I have for long been a proponent of the concept of 'Gandhian Engineering', which to me means getting more from less for more people and not just for more profit.

We have seen that inclusive innovations provide instant benefits to people. They also deliver bigger and long-term healthcare outcomes. Perhaps they could also be triggers for creating demand for better healthcare services in general and jolting the system out of its current inertia.

The ultimate goal should be 'affordable excellence' in healthcare so that even as systemic transformations are awaited, the highest quality of medical care is made available to the rich and poor alike.

Taking the highest standards of healthcare to the poor is particularly important because it empowers them to compete and reverse generations of inequality. To move forward, people need to first be healthy.

Innovations, however, don't come off the shelf. They have as much to do with technological prowess and talent as happenstance and personal experience. For most innovators the innovation is the endpoint of a journey.

Work on Dengue Day 1, for instance, was begun by Dr Navin Khanna at the International Centre for Genetic Engineering and Biotechnology with funding from the Defence Research and Development Organization. But since DRDO's terms of funding were restrictive, an alternative test was created and patented. Thereafter, the test languished until the big dengue outbreak and the South Korean ship mistakenly taking the consignment of dengue test kits to Africa. What if the ship had come to India?

Inclusive innovation is really entrepreneurship at its best. It needs to be nurtured in a social and economic framework which recognizes its huge potential to deliver better healthcare and simultaneously deepen and broaden existing markets through revolutionary price points and transactions that serve the poor.

Eleven years ago we started the Anjani Mashelkar Inclusive Innovation Award (AMIIA) in memory of my mother. She brought me up, facing all the odds that an extremely poor and uneducated widow moving to Mumbai with her only child — a six-year-old boy — would face. And this she did with courage and dignity.

When she passed away, we found all the money that was given to her for her small personal expenses from time to time over the years tucked away in her cupboard with a note that said: 'Use this money to do science for the poor.'

Since then, the award in her name is given each year at the inauguration ceremony of the annual National Inclusive Innovation Conference on November 17, the day she left us.

With its decade-long journey now, the award has been recognizing stellar inclusive innovations that have managed to solve the problems that need to be solved as opposed to those that can be solved. These innovations were born of the minds and hearts of compassionate innovators who sometimes left their cushy careers to dedicate their lives to improving quality of life for the disadvantaged. They connected the dots, applied the most advanced technology, reimaged delivery and in the process reinvented healthcare models.

Dengue Day 1 was one of the awardees. But let me introduce you to the others and their amazing journeys:

OralScan: Optical device detects oral cancer early at low cost and without a biopsy

As with all cancers, oral cancer has to be detected early for treatment to be successful. But it is not easy to visually detect changes in the tissues in the oral cavity. A doctor using a torch can at best have a subjective assessment and as a result diagnosis can be way off the mark.

Cancer can be confirmed through a biopsy, but it is expensive and can also be painful for a patient when multiple tissue samples have to be collected. For biopsies to be accurate, tissues have to be collected from the most malignant site in the lesion.

The problem multiplies when you are in a rural area. Lack of proper diagnostic equipment, doctors and technicians means people have to travel to the nearest town.

Dr Subhash Narayanan, founder of Sasan Meditech, has invented OralScan, a breakthrough device that provides early, accurate and cost-effective detection of pre-cancerous lesions.

OralScan uses an optical system with custom-built software and algorithms



Dr Subhash Narayanan



for tissue analysis. It enables the physician to visualize and discriminate between healthy and potentially malignant sites.

With good accuracy, 97 percent sensitivity and 92 percent specificity, the technician or the doctor can easily detect cancer and eliminate the need for a biopsy. If there is any suspicion of cancer, OralScan pinpoints the site from which the tissue for a biopsy should be taken. This eventually saves the patient the pain of multiple biopsies and the associated costs.

OralScan is currently being used for screening and early detection of oral cancer in seven hospitals and dental colleges. So far, it has been used for screening thousands of patients in remote villages in Karnataka, Kerala, Maharashtra and Arunachal Pradesh.

Dr Narayanan's mother was wrongly diagnosed with cancer. Driven by his personal experience, he took up the challenge to make diagnosis less subjective and invasive.

He worked as a research scientist at the Centre for Earth Science Studies in Thiruvananthapuram from 1980 to 2013.

During his scientific career, he had gained deep expertise in biophotonics, optical spectroscopy and multispectral imaging. He started working on this innovation in 2005 and prototyped his system.

iBreastExam: Non-invasive and affordable, it makes breast cancer screening easy

In 2007, a young Mihir Shah was about to get married when his soon-to-be mother-in-law was diagnosed with breast cancer. She underwent chemotherapy and survived, wearing a wig to the wedding. This experience led to Shah setting up UE LifeSciences along with co-founders Matthew Campisi and Bhaumik Sanghvi.

When they started to dig deeper, they learnt that over 90 percent of women in the developing world did not have access to any mechanism for early detection of breast cancer. In India a woman is detected with breast cancer every four minutes.

The incidence of the disease in India is on the rise in both rural and urban areas and there is a huge unmet need for quick and early detection, which is the best way to improve outcomes from treatment. To meet this need they came up with iBreastExam, an early screening device for breast cancer. Early detection is the best way to improve outcomes from the treatment of breast cancer.

iBreastExam uses innovative sensor and material technology combined with software computing to accurately identify cancerous lesions and tumours. This breakthrough technology has the potential to dramatically improve the accessibility and affordability of breast cancer screening. It is portable, radiation-free and non-invasive. It has been approved by the FDA in the US, ensuring that the screenings are safe, pain-free and private.

They have also proposed an innovative pay-per-use model — instead of targeting direct sales — which allows doctors in every corner of the country to start screening women for breast cancer at the earliest.

iBreastExam has reached over 350,000 women in 12 countries. With devices currently on the market, over one million women will soon receive a safe, affordable and radiation-free breast exam in the convenience of a community health centre or their homes.

The second-generation iBreastExam sensor technology has improvements (spatial resolution, data frequency, power consumption, ease of use, clinical efficacy) by orders of magnitude over the first-generation technology, helping expand access to many more women globally.

In 2017, GE Healthcare announced a distribution partnership with UE LifeSciences to take iBreastExam to women in 25 countries. UE LifeSciences has also forged strategic partnerships with big pharma and leading medical device distribution channels. Recently, it entered into a distribution agreement with Siemens Healthineers for the US market. The World Bank and IMF have rightly recognized their innovation with the prestigious 2022 Global Women's HealthTech Award.



Mihir Shah



Sanket: ECG device, size of a credit card, records readings on a smartphone

When Rahul Rastogi's father was admitted to hospital after complaining of a heavy feeling in his chest, tests showed he had been on the brink of a massive heart attack. That near-crisis and the stress of regular follow-up tests after the angioplasty made Rahul and his wife, Neha, ponder if heart monitoring could be done differently.

Both were electronics engineers by education and working as engineers at well-known multinational corporations, CSC and Samsung. They decided to quit their jobs to create a gadget to help people monitor their heart function on their own at home, hence providing early warning of a crisis. With nearly 30 million people suffering from heart ailments, India is unfortunately known as the heart disease capital of the world. Heart attacks are also notoriously difficult to detect.

The Rastogis developed Sanket, an ECG recorder, which makes monitoring the heart as simple as taking body temperature. It is low-cost and extremely portable, being the size of a credit card. It has 12 leads and connects to a smartphone wirelessly, displaying and recording ECG graphs, also on a smartphone. The ECG report can be shared instantly with a doctor via email, Bluetooth — and even WhatsApp!

Sanket does away with expensive ECG machines, distant hospitals or laboratories and skilled technicians. It has over 200,000 users.

Their organization, Agatsa, has evolved to serve not only India, but Turkey, Germany, the US, Brazil, Australia, Malaysia, Bangladesh and the UAE.

TouchHb: Non-invasive anaemia check gives on-the-spot readings from anywhere

Iron-deficiency anaemia is a significant health crisis among women in India. It is recommended that pregnant women get a haemoglobin (Hb) check done every three months during pregnancy.

Unfortunately, some patients may live at a distance of up to 15 miles from a primary health centre. Travelling this distance is not only uncomfortable for them, it also leads to the loss of a day's wages. The invasive method of pricking the finger to draw blood is an unpleasant experience as well.

Myshkin Ingawale, an IIM Calcutta alumnus, has invented a handheld, non-invasive device called TouchHb to measure haemoglobin.

His invention went through as many as 32 iterations before Ingawale was satisfied with its performance. He and Abhishek Sen are now co-founders of Biosense Technologies.

TouchHb is a portable, battery-operated device which can produce an on-the-spot reading without a prick. The patient simply has to place a finger in the clip or probe. The readings are available within 60 seconds!

It works using optical technique photoplethysmography (PPG) where light of



Rahul Rastogi



Neha Rastogi



different wavelengths is shone through skin tissue. This helps in understanding the concentration of haemoglobin in the tissue. No special skills are needed to use this device.

Since there is no need for needles, lancets, micro-cuvettes, blotting paper and so on, recurring costs are limited to the expense for batteries and no bio-waste is generated. The device only requires annual maintenance.

In addition to haemoglobin, TouchHb also measures oxygen saturation, temperature and pulse rate. The cost of a test would be about ₹10 or one-fifth the cost of conventional tests!

SaveMom: IoT-based maternal healthcare solution monitors pregnancies remotely

When Senthil Murugesan, co-founder of JioVio Healthcare, visited his sister while she was pregnant in 2016, she was living on the outskirts of Madurai. She was often anxious about her pregnancy and would have to travel all the way to a city hospital for check-ups. Murugesan decided to visit her gynaecologist and ask about the vital parameters to be tracked for a pregnant woman.

He bought blood pressure and blood glucose measuring devices and replaced their display screens with a blue chip that would SMS his sister's readings to the doctor, who would then evaluate them and message her back. The doctor would remind her to take the prescribed medicines and supplements and have a good diet. After his sister's positive experience, it struck Murugesan that he could help many more women who had little or no access to healthcare facilities.

Globally, hundreds of thousands of women die preventable deaths every year due to pregnancy-related complications. In India, because many health departments are short-staffed, rural women are nearly three times more likely to die from complications during pregnancy or childbirth than those in urban areas. Many of these women are still wary of the modern healthcare system and cannot afford frequent visits to far-off hospitals.

While a mother's death is a tragedy in itself, it has even worse cascading effects — her child is 15 times more likely to die before the age of two, and her other children may also die prematurely.

Murugesan set himself up to solve this problem. He developed SaveMom, an IoT-based maternal healthcare solution. SaveMom monitors a mother's health using smart wearables that collect various physiological signals (blood pressure, heart rate, temperature, respiratory rate, ECG, oxygen saturation and glucose) continuously. These signals are processed with advanced techniques and a risk assessment is done continuously to ensure that she is healthy. The vitals are uploaded in the cloud for doctors to view remotely.

Caregivers and doctors are alerted if any mother's risk assessment is negative, so that preventive measures may be taken at the right time.

The innovation consists of Allowear, a unique jewelry-inspired wearable device with six months of battery life. It tracks sleeping and steps taken, and provides reminders for medicines. It was specially designed to discourage men in the pregnant woman's household from using it — which commonly happens with wearables in rural homes.

The second component is Allotricoder, an integrated non-invasive device that captures six vitals — blood pressure, heart rate, temperature, respiratory rate, ECG, oxygen saturation and glucose — digitally and sends the information to an AI engine for analysis.

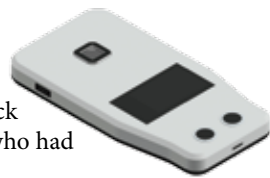
The third component is AlloBMI, a simple weighing scale integrated with the application to monitor the steady rise in weight during pregnancy. This was especially necessary for rural areas where women astonishingly lost weight during the course of pregnancy, leading to unnecessary complications.

SaveMom has successfully addressed data manipulation malpractices of healthcare workers by ensuring that vital information can only be collected in the homes of the pregnant women after synchronizing the wearable devices to a mobile application. This ensures that the health worker visits a home every two weeks. The collected vital information can be sent to the doctor in real time for feedback.

JioVio has collaborated with local government agencies and NGOs for



Senthil Murugesan



providing 1,000 days of care to mother and child for ₹1,000 that covers 15 antenatal check-ups for the mother and post-natal care for the baby. The solution has been deployed in over 100 villages in the southern states and benefited thousands of pregnant women by conducting tens of thousands of ante-natal check-ups.

There has been positive impact on the health of babies as well. For example, most babies born in the tribal region of Wayanad were underweight, so JioVio developed an innovative method to deliver nutrition to the rural mother using a drinking water source.

anuPath: Handy diagnostic tool to track diabetes and related problems

Vinay Kumar, co-founder of PathShodh Healthcare, lived in a remote village in western UP where the health facilities are not up to the mark even today. At the age of 14, he was diagnosed with a chronic condition called juvenile diabetes — a sad turning point for both him and his family.

He had to take daily insulin injections to manage his illness. There was no doctor or testing facility in his village and no one in his family had even heard about juvenile diabetes until that point!

Kumar's childhood experiences taught him the importance of science and motivated him to pursue research in public health and chronic disease diagnostics.

His mission eventually led him to set up PathShodh Healthcare. The company was incubated at the Centre for Nano Science and Engineering (CeNSE) at the prestigious Indian Institute of Science in Bengaluru.

Kumar and his colleagues developed anuPath, a point-of-care biosensing device that can measure multiple parameters related to diabetes, chronic kidney disease, anaemia, malnutrition and protein deficiencies. What's more, it does not need special storage conditions and is ultra low-cost — 80 percent cheaper than conventional testing methods!

Globally, 425 million people suffer from diabetes and 1.6 million deaths are attributed directly to the chronic disease each year. It causes serious health issues, including blindness, foot amputations, heart attacks, chronic anaemia and kidney failure. anuPath is a pioneer, bringing the power of the hbA1C test in monitoring diabetes to the point of care.

Axiostat: Advanced wound dressing that stops heavy bleeding in two minutes

Around 40 percent of road accident deaths result from bleeding and there are 150,000 road accident deaths annually in India.

About 10 years ago in Delhi, Leo Mavely was a volunteer for efforts to help road accident victims reach hospitals in time. One day, he witnessed an accident in which a bus hit a bike, leaving the rider bleeding profusely.

Luckily, Mavely managed to take the victim to hospital in time and he survived. However, after watching the victim bleed profusely on the way, Mavely recognized the need for something revolutionary that could stop high-pressure bleeding and would save lives and, in the process, advance healthcare in India.

He did some research, but couldn't find a single product in India that would stop such bleeding instantly. First responders only used gauze with high pressure, which is not enough for severe bleeding.

Mavely decided to explore biomaterials for a possible solution to prevent blood loss through open wounds during the golden hour: the one-hour period after an accident when a victim's chances of survival are believed to be the highest.



Vinay Kumar



Leo Mavely



In 2008, Mavely launched his company, AxioBiosolutions, to address this gap. He developed Axiostat, an advanced wound dressing that stops traumatic external bleeding. It utilizes the unique biomaterial, Chitosan, in a novel sponge form. It is India's first developed, patented and commercialized emergency haemostatic dressing. It works on a unique charge-based mechanism of mucoadhesion which forms a mechanical barrier on the bleeding site.

The dressing is gamma sterilized, painless, and even works on patients on blood thinners. The versatile dressing can be cut, folded and stuffed into deep wounds — and it has no side effects. A key feature is the speed with which it stops bleeding — while standard gauze takes over 13 minutes, Axiostat takes just over two minutes to completely staunch bleeding!

With a presence in over 40 countries, AxioBiosolutions has today become a global name that uses innovative medical technology to create breakthrough products and save people's lives.

Axio has a research collaboration partnership with Harvard Medical School to bring the latest scientific and technological innovations into the surgical and advanced wound care market. Advanced science and technology working for the disadvantaged!

3nethra: Comprehensive, cheaper eye test that makes dilation redundant, saves time

When Shyam Vasudev visited Aravind Eye Hospitals to meet its famous founder, Dr Govindappa Venkataswamy, popularly known as Dr V, he did not know that it would change his life.

During his visit, Vasudev found that most eyecare equipment was imported, not portable and required a lot of power and expertise. Tests would take up to three or four hours. He decided to do something that would enable the wonderful doctors at Aravind Eye Hospitals to deliver better eyecare to people in the remotest corners of the country.

Thus, 3nethra was born — an intelligent, portable, non-invasive and low-cost device. It is also non-mydratric, meaning it does not require pupil dilation, thus avoiding loss of working hours that a daily-wage worker can ill afford. It helps in pre-screening of five major eye diseases — cataract, diabetic retina, glaucoma and cornea and refractive index with powerful inbuilt auto-detection software.

More specifically, 3nethra is a digital fundus camera, equipped with an efficient workflow to capture high-resolution images of the eye through a quick-focus mechanism that reduces the examination time. It costs one-sixth of the current cost of collective pre-screening devices and can be operated by minimally trained personnel. The solution has a value proposition for everyone in the entire eyecare value chain from the elderly and rural poor to doctors, hospitals and entrepreneurs and pharmaceutical companies.

They currently have more than 3,350 devices in place in 45-plus countries and have screened more than eight million people with 75 percent of them being in India. Initially, they had only one version of the device which was used for adults and children above 10 years of age. Now, they also have several models and are in a position to screen all pre-term babies.

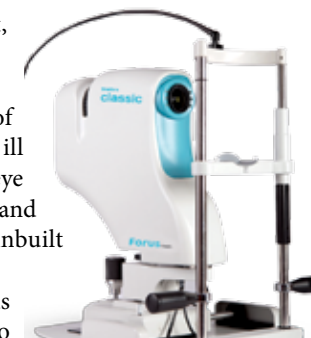
Dozee: Turns an ordinary hospital bed into a step-down ICU in a matter of minutes

It is estimated that India has only 1.9 million hospital beds and 95,000 ICU beds, three times less than the requirement. Most of the beds are concentrated in the private sector with substantial variation in available resources across states. While this has always been a healthcare problem it became even more critical during the COVID-19 pandemic. In addition, ICU beds are neither accessible nor affordable for a vast majority of the population.

An alumnus of IIT Bombay, Mudit Dandwate was actively involved in designing race cars before inventing Dozee. In fact, Dozee monitors the micro vibrations in one's body in much the same way as vibration sensors are used to



Shyam Vasudev



check the health of cars. Dandwate was working in an automobile company in Germany, when he came up with this idea.

"I was away from home and my parents' health was always at the back of my mind," he recalls. On his 24th birthday, he decided to resign and come back to India. His concern for his parents led him to devise and manufacture a health monitor. He roped in Gaurav Parchani as co-founder and Pritish Gupta as chief operating officer.

Dozee is a continuous, contact-free vitals monitor with remote monitoring capabilities and an alerts system that converts any bed into a step-down ICU in less than two minutes. Priced at less than ₹9,000, it is about one-tenth the cost of conventional alternatives. Kept under the mattress, Dozee monitors patients' heart rate, respiration rate, heart rate variability, oxygen saturation levels, blood pressure and activity levels through technology based on ballistocardiography. The device also lets clinicians set thresholds to trigger alerts for body vitals.

The device has medical-grade accuracy of 98.4 percent — as accurate as ECG, 2D Doppler Echo, RIP Bands. The data is uploaded to the cloud to afford remote access for clinicians. The data is further analyzed using advanced machine learning and artificial intelligence algorithms to profile the user. Setting up Dozee requires minimal technical expertise and it can be used in home settings. It can help reduce the workload of healthcare staff by almost 50 percent and provide proactive care.

In COVID times, thousands of beds were enabled with health monitoring, helping patients across seven states in India. Dozee is in use in 300 hospitals and 6,500 beds have been converted to step-down ICUs. Around 150,000 nursing hours have been saved by Dozee.

Dandwate set up an aspirational MillionICU initiative. It has received support from a large international public health organization to introduce continuous remote monitoring and AI-based early warning systems for 6,000 beds — beginning with 500 beds in Nepal, Bangladesh and Tanzania. Dozee is becoming an iconic global inclusive innovation.

PROPELLING INCLUSIVE INNOVATION

The power of inclusive innovation is infinite. My heart warms on seeing young, educated scientists, technologists and entrepreneurs commit themselves to this cause.

What do we now need to ensure that this movement gains momentum? Venture capitalists should not only look at three-fold money multiples but also three-fold life multiples. Can we prolong healthy life for millions of people? Can we give them a second chance to enjoy life to the fullest? Can we bring a smile to the faces of those in pain? All this is possible, if our head listens to our heart.

Second, there must be new financial instruments to support such inclusive innovations. The Anjani Mashelkar Foundation doesn't just give awards but does everything possible to take innovations to the marketplace so that great ideas have an impact.

For example, when Tata Trusts were approached for support for the Sanket ECG device so that it could be perfected from a six-lead device to a 12-lead one, it took the trusts no time to write a ₹48 lakh cheque, and that too not as a loan but as a generous grant.

The Biotechnology Industry Research Assistance Council or BIRAC is doing a commendable job in incubating and supporting such inclusive innovations. Corporations now need to give a helping hand and take some risks by betting on the passion of these inclusive innovators, who want to do well by doing good.

What is required is compassionate capitalism, which can take different forms. Corporations have so far done CSR 1.0, that is, doing well and doing good. In other words, become rich first and then support a societal cause.

Science and the excluded

Anjani Mashelkar was a woman ahead of her time. More than seven decades ago, when it wasn't easy to bring up a child singlehandedly, she was eking out an existence in Bombay, a big and unfamiliar big city to her.

Poor, widowed and uneducated, she brought up her young son against many odds.

Raghunath Anant Mashelkar went on to have innumerable achievements in the world of science. And when he wanted to honour the courage with which his mother had groomed him, he set up the Anjani Mashelkar Foundation in her name after her passing.

The foundation's focus is on institutionalizing and integrating science, technology and innovation to benefit people who live in poverty. Its mission is to promote



inclusive growth through technology and science.

The Anjani Mashelkar Inclusive Innovation Award is a flagship programme of the foundation.

It recognizes and rewards game-changing inclusive innovations

that are characterized by extreme affordability and high technology and can be scaled up sustainably with speed.

The award honours those who create not just 'best' practice, but 'next' practice. The foundation has recognized 13 innovations over the past 11 years.

The foundation helps awardees in their journey from 'ideas to impact'. It supports them by making critical interventions in upgrading of technology, fundraising, opening doors for partnerships and scaling.

But what we need now is CSR 2.0, which is doing well by doing good. In other words, doing good itself as a business — say, an extremely affordable high-quality vaccine.

I proposed this concept of CSR 2.0 in my K.R. Narayanan oration in 2019. But earlier, in 2000, I had co-authored a paper with C.K. Prahalad titled "Innovation's Holy Grail: More from Less for More" for the *Harvard Business Review*, in which we set out a strategy for corporations to do well for themselves by becoming profitable while doing good for society.

We can also support inclusive innovation through the use of CSR funds in team India fashion. Dozee, the much needed step-up ICU, had a challenge in deployment even as people were dying in ambulances due to the huge shortage of ICU beds. Why? Public hospitals could not buy them due to lengthy tendering processes. Donations flowed in from around the world and that is how Dozee was installed across hospitals in India.

We need public-private partnerships in which funds come from CSR and the public sector helps with policies, infrastructure, regulations, and so on.

It is important for the government to support inclusive innovations through public policies. Tax exemptions, excise duty reductions, massive public procurement support for early-stage market seeding and market expansion are needed.

India created a world record by raising the share of LEDs in lighting from 0.2 percent to 88 percent in seven years through innovative demand aggregation and distribution/deployment. Can we not do this for diagnostics if CSR funds were pooled together, even regionally? Massive bulk purchases and deployment of such devices can be done on a huge scale across India. This could cause a paradigm shift.

India needs an inclusive innovation initiative. In this, scientists will have to be given special charters to work on cutting-edge science that leads to inclusion. They should be incentivized to create products with 'affordable excellence'. Such an effort should be backed by systems and processes that will create acceptability and accessibility for the rural masses.

New matrices for judging individual as also institutional performance are needed for this purpose. The highest performance at the lowest price should be a goal that brings rewards. The ensuing competition will spark unconventional and bold thinking and will engender possible solutions for impossible-seeming problems. ■

Dr Raghunath Anant Mashelkar is an influential thought leader who is globally recognized and honoured for his contributions to science and technology.

The decline of debate

DELHI DARBAR



SANJAYA BARU

ON August 5, 2019, I met Arun Jaitley, the Bharatiya Janata Party (BJP) leader, for the last time at his home. Soon after, he passed away. As I was ushered into his room, where he sat uncomfortably with many tubes inserted into him, I saw him watching the discussion in Parliament on the Union government's decision to repeal Article 370 of the Constitution that gave the state of Jammu and Kashmir (J&K) a special status.

"You must miss being there and they must miss you too," I said to him. He smiled wistfully. Jaitley was a star parliamentary debater. The press gallery would be full when he spoke, whether criticizing or defending the government of the day. His speech in Parliament in 2015 on the matter of the National Judicial Appointments Commission still rings in one's ears. But then, there were so many. Be it in English or in Hindi, he spoke with passion, demonstrating his command over facts, and held his audience spellbound.

Jaitley was not an exception. There have been many parliamentary orators like him. Indeed, in my judgement, among the greatest of parliamentary speakers in my three decades in New Delhi remains, unquestionably, Atal Bihari Vajpayee. Recordings of his speeches in Parliament are still viewed on YouTube and millions watch them even today. Some of the most illuminating parliamentary debates were the ones on the India-United States civil nuclear energy agreement in the period 2005-08. If Jaitley, Arun Shourie and Yashwant Sinha were the star speakers of the BJP, Kapil Sibal, Anand Sharma and P. Chidambaram spoke eloquently for the government.

Some of Prime Minister Manmohan Singh's best speeches, erudite and hard-hitting, were made during the several debates on the nuclear deal. In a debate on the government's decision to waive loans to farmers, Dr Singh suddenly departed from a written draft speech to quote the poet, Oliver Goldsmith, extempore from memory:

"Ill fares the land, to hastening ill a prey, / Where

wealth accumulates and men decay; / Princes and lords may flourish or may fade; / A breath can make them, as a breath has made; / But a bold peasantry, their country's pride, / When once destroyed, can never be supplied." Members heard him in stunned silence and the argument was sealed.

Reporting such experiences has been the stock-in-trade of generations of journalists in Parliament. What now? There are the occasional interventions of a Manoj Jha of the Rashtriya Janata Dal, or a Mahua Moitra of the Trinamool Congress, that are not only heard within the House with interest but also make it to social media and remain there to be viewed again and again.

Sadly, however, there is no one from the treasury

make an effort to speak cogently and address issues and so do members of the Opposition. Perhaps other state assemblies also have spirited discussions. The question is: how many bother to listen to them, on television or social media, and how well are they reported in print and online media?

Parliamentary reporting has also suffered along with parliamentary debate. There is far too much focus on corridor gossip and controversy than on substance. Many journalists use their access to the lobby to network. Rarely does a news report of substance emanate from Parliament these days. The live telecast of Parliament and legislatures was originally aimed at offering the citizen a peep in.

What the viewer now gets is either a lot of shouting in the background or a sanitized view that rarely gives the flavour of the proceedings.

What also discourages a viewer of parliament television is the thin attendance on most days. A member may be making an important speech but when the camera pans and shows a virtually empty house one wonders how important that intervention would have been from a policy perspective. Is anybody listening?

All this is a loss for civil society. Getting people interested in parliamentary debate and discussion is an important aspect of democracy. I recall visiting Stockholm in the 1990s and walking into the visitors' gallery that was open to all. I went in, sat in a crowded gallery and came out



Arun Jaitley was a star parliamentary debater

benches, not even the prime minister, who makes a speech worth hearing in order to be either educated or illuminated. Entertained? Yes. There are many entertaining speakers on both sides of the House, but few erudite ones. Prime Minister Narendra Modi has not only made his appearances in Parliament rare but has used his opportunities to speak more to mock the Opposition than explain his policies. The tone and tenor of parliamentary debates are set by the leader of the House and the leaders of the Opposition. On neither side of the Lok Sabha or Rajya Sabha do we find much to inspire these days.

If Parliament is in such a sorry state, what of state legislatures? Unfortunately, one does not get adequate news coverage nationally of what happens in state legislatures. Perhaps there are legislative assemblies in which debates are more lively and educative. I have watched a few in my home state of Telangana where in the state legislature one can see that both the chief minister and his senior colleagues

astounded that, as a foreign tourist, I could do this. Civil society engagement in the legislative process is necessary and an important part of sustaining parliamentary democracy.

There is so much public and media focus on elections but so little on what the elected do. Most newspapers have ceased to publish 'Today in Parliament/Assembly' columns. Television shows only drama, when it is staged, and rarely nuanced debate. All this is more recent. When the nuclear deal debates went on even private TV channels televised the proceedings live because the discussions were so riveting and consequential. Both have become rare.

When was the last time you were glued to your radio or television, listening to a debate in Parliament that was both entertaining and illuminating? Honestly, I cannot recall any debate from the past five years. ■

Sanjaya Baru is a writer and Distinguished Fellow at the United Service Institution of India

Rebuild India the Gandhian way



LET'S
TALK

ARUN MAIRA

GENERATIONS to come, it may well be, will scarce believe that such a man as this one ever in flesh and blood walked upon the Earth, said Albert Einstein on Mahatma Gandhi's 70th birthday.

Four eminent scholars of Gandhi's ideas — Rajmohan Gandhi, Lord Bhiku Parekh, Prof. Gita Dharampal and Alan Nazareth — and four senior government leaders — former Chief Justice of India M.N. Venkatachaliah, former Vice President Hamid Ansari, former J&K Governor N.N. Vohra and former Foreign Secretary Shyam Saran — reflected together, on January 31, 2022, a day after the Mahatma's 74th death anniversary, on "The Great Pertinence of Gandhi to India in the 75th Year of India's Independence". The seminar was hosted by the India International Centre.

When Gandhi returned to Delhi from Bengal, where he had rushed to stop Hindu-Muslim riots, he was dismayed by the violence erupting amongst Hindus, Muslims and Sikhs in the national capital so soon after the country's independence. Rajmohan Gandhi recounts that Gandhi was so disheartened he said he did not wish to live until his next birthday. Tragically, before that he himself became a victim of the communal hatred.

All speakers were dismayed that India today seems as divided as in Gandhi's time. They agreed on the imperative to go beyond recollection of Gandhi's greatness, as we do annually, to actually applying his ideas.

Gandhi had a vision of a country not divided into fragments by religious and communal walls, and a country in which every Indian, whether rich or poor, could hold their head high in dignity. This was India's "tryst with destiny" to which the country awoke on August 15, 1947, in Jawaharlal Nehru's ringing words. Clearly, we yet have "miles to go before we sleep", in the words of Robert Frost that Nehru kept on his desk.

Nehru and Gandhi were not aligned on the path India should take to its tryst with destiny. Nehru chose the path of large-scale enterprises: the path to progress adopted by most countries — the Soviet Union and the US too. The Soviets and Americans disagreed about who the enterprises should belong to — a people's government or to capitalist owners. Gandhi recommended another, less travelled by, road to build a free society. He advocated smaller, human-scale enterprises, owned by the people and

governed by the people. Gandhi was not against capitalists. He wanted capitalist enterprises to be internally democratic. Moreover, he wanted rich capitalists to be trustees of the wealth that society enables them to create.

Einstein said, "The world as we have created it is a process of our thinking. It cannot be changed without changing our thinking." Inner transformation must accompany the external transformation one wants in the world. Be the change you want to see in the world, Gandhi said. He was a man of action too. He knew that inner transformation is not enough to change the world. One needs new ideas as well. To change the world, we cannot just be compassionate like Gandhi. We must also think and act like Gandhi.



Photos: Civil Society/Ashoke Chakrabarty

Mahatma Gandhi is a remarkable role model for the whole world

Inner transformation must accompany the change one wants in the world. Be the change you want to see, said Gandhi. He was a man of action.

Gandhi was a systems thinker par excellence. Knowledge, in his mind, could not be divided into silos. Prof. Dharampal pointed out that Gandhi's ideas contribute to every aspect of life: to philosophy, psychology, science and economics, and to the theory of organization, society and the state.

Lord Parekh cautioned that Gandhi's practices must not just be mechanically repeated like rituals, nor his ideas repeated like mantras. The underlying principles forming his ideas must be contextualized to drive innovative, contemporary solutions. Therefore, the discussion concluded with a distillation of the principles that are most pertinent today to change the world.

One was that large transformations can be brought about only by large movements, not by large organizations: whereas the widespread theory-in-use, in government, business and even the social sector, is that large change requires large organizations. Catalyzing movements and managing organizations require very different orientations and skills. Aspiring systems transformers on scale must learn how to lead movements, not how to be CEOs of organizations.

Leaders of movements take the first steps towards something they deeply care about, in ways that others wish to follow. Whereas a CEO can use sophisticated carrots and sticks designed by HR experts, movements' leaders have only their vision and values to draw others to follow them and together create a world all aspire for. Leaders atop large organizations, with large resources, can bestow benefits on people. Thereby they disempower people. People are empowered when they have freedom to bring about change themselves.

The world is beset by multiple problems at the same time: environmental degradation and climate change; social inequities and unequal opportunities; persistent poverty and vulgar inequalities in wealth and income. The problems are intertwined. Therefore, economic, environmental, social and political systems must be changed together. This is complex, no doubt, but that is the only way to produce sustainable transformation.

These multi-faceted problems are manifesting themselves in different ways in different parts of the world. A standard, 'one size' solution will not fit all. The vision of all, of the better world they aspire for, may be the same. However, they must take different paths to get there, starting from their different present realities. People must have freedom to choose their own ways. Not only is this empowering, it is the practical way to produce well-rounded solutions rather than theoretical constructs from distant experts in silos. Ergo, Gandhi's way of local systems solutions cooperatively developed and implemented by communities is the solution to the multifarious challenges that India and the world are facing.

Consensus about the vision of their country, and consensus about how citizens will work together to realize their vision is the essence of a democratic society. The British divided us to rule: why must we divide ourselves again? India's beauty is its diversity. We must maintain it and work together to meet our tryst with destiny. In Gandhi's conception of a genuinely democratic society, citizens would listen to the views of people who are unlike them and respect others' cultures. Mahatma Gandhi is a remarkable role model for the whole world to look up to. And his ideas can guide us onto a better path. ■

Arun Maira is the author of 'A Billion Fireflies: Critical Conversations to Shape a New Post-pandemic World.'

2030 can be India's techade



LOOKING
AHEAD

KIRAN KARNIK

ELECTIONS in many states this year and for the Lok Sabha in 2024; the 75th anniversary of Independence and of the Republic; the biggest country; the third largest global economy — these and other important milestones mark this decade, culminating in the 80th anniversary of the Republic in 2030. As we look expectantly and with hope towards a bright future for the country and each citizen, it is necessary to analyze what might influence where we reach in 2030. What can be done to ensure more positive outcomes? More importantly, what is the destination and which are the goals we want to achieve?

This column, through a series of articles over the course of the coming months, will seek to identify and analyze the major factors that will determine how fast we move and where we will be in 2030. Each piece will discuss an "influencer" area and its possible status in 2030. The purpose is to stimulate a debate: in these columns and through our readers within the groups that they are associated with.

At the outset, it must be noted that this author is an incurable optimist. Therefore, though the column may sometimes paint dystopic pictures, the overall lens through which we view the future is of definite optimism. Like Indian weddings, this country has established an ability to overcome chaos, conquer all odds, be resilient, and finally achieve success. Hence, the optimism is probably nothing more than realism!

As a natural segue with this author's earlier column (Tech Tales) in *Civil Society*, we begin this series with technology. To say that technology is all-pervasive and ubiquitous is trite, and yet largely true. Only "largely", though, because the forced shift to online teaching in the past two years has highlighted that millions of children lack access to the technology (devices) required, resulting in great educational deprivation. Similarly, we know that hundreds of millions did not have the comfort of online purchases, financial transactions, information access or socializing. We must urgently end this access inequity because technology will, without a doubt, be a vital necessity by 2030.

By the end of the decade, technology will be a major driver of India's economic growth through what one may broadly call the hi-tech sector. One example is the space industry, which is yet nascent but growing very rapidly. Already an important element of the national space programme, it will ride the worldwide boom and capture a part of the global market. India's already-large pharma sector — a world leader in vaccine production — will see further and high-value growth through investments

in R&D, strengthening its position as the "world's pharmacy". New medical devices, based on combining bioscience with electronics and software, constitute another area in which Indian innovators are making waves. High-tech wearable health devices will become mass products. Remote diagnostics and tele-consultation will be the norm for much of the population, creating a large, new market.

There will be strong growth in manufacturing and maintenance of tech products such as mobile phones, TV sets, telecom equipment and so on. Even if only a part of the value chain is in India, it

runners: for example, in the production of electronics and nuclear energy. In both fields, early leaders had the foresight to initiate action for creating a talent base, institutional mechanisms and a fair degree of industrial capacity. But somewhere, a few decades ago, we lost the plot (possibly our ambitions and thrust too) and settled for short-term quick fixes. Fortunately, recent developments now provide new opportunities which must be leveraged.

India's ability to capitalize on the huge opportunities and ensure strategic autonomy in the tech area will depend on its actions in the next few years. In this, there is much to learn from the



Electric vehicles and hydrogen fuel will dominate transportation

will add considerably to both GDP and employment.

India's huge thrust on green energy, related to the commitments we have announced at global fora, is already creating a big demand for products linked to solar and wind power, nuclear and hydel energy, and production of green hydrogen. Recycling and reuse technologies are being invented or adapted. Electric vehicles and hydrogen as a fuel will slowly but surely dominate transportation. In these areas — as in space — we are already witnessing an upsurge in start-ups and innovation. The "greening" of existing industrial processes through new technologies, the use of additive manufacturing, robotics, AI and automation — so-called Industry 4.0 — will add considerably to the growth of the tech sector.

These and other areas like Agritech will add to the boom already taking place in Fintech and Edtech, making the tech sector an engine of India's economic and job growth, with high export potential.

Yet, when we look at the global scene, one cannot but help feel that we missed the bus in some areas where we were at one time amongst the front-

phenomenal ongoing success of our globally competitive IT software industry. Conducive policies, industry-government partnership, training, agility, far-sighted leadership and innovation are some features, apart from the guiding hand of the industry association.

In order to derive the full benefits — economic gains, employment, inclusive development, strategic autonomy and power — that the tech sector could deliver for India, there are some necessary conditions. These include visionary leaders, facilitative policies, an ecosystem that promotes innovation, large R&D investments, upgrading educational standards and institutions, large-scale skilling, autonomous and well-funded research institutions, and government-industry partnership. A framework that ensures these across different tech areas will most certainly help India to not only fully capitalize on the promise of technology, but also to become a global leader in a few areas by 2030. It can then truly become India's techade. ■

Kiran Karnik is a public policy analyst and author. His most recent book is 'Decisive Decade, India 2030: Gazelle or Hippo.'

Bulls to become dinosaurs?

BHARAT DOGRA

IN a country where bullocks have served humanity in numerous ways for thousands of years and, in fact, continue to do so in a large number of villages, it is likely to be deeply troubling that high-level efforts with complete official support are in full gear to prevent bullocks from arriving on Earth.

The means to achieve this is the so-called sexed semen technology aimed at ensuring that male calves (bullocks) are not born and only female calves (cows) are born. This is being done in the name of resolving the stray cattle problem. Ninety percent 'success', in terms of having only female calves, is claimed by promoters of this technology.

Sexed semen technology was devised in the US where patents were obtained. Then, about a decade ago, we started hearing about it in India. At first, due to patent-related factors, the spread of this technology was expensive and hence slow in India, but its promoters found ways of working out indigenous, cheaper versions which could achieve similar results. To some extent this contributed to its rapid spread. About six years ago, government support became firmer and since then sexed semen technology has been spreading fast, with a minister claiming even that 'cow factories' will be set up.

The *Hindu Business Line* reported on December 27, 2019: "The country has found an innovative solution to control stray animal population. It is implementing the sex-sorting semen technology for artificial insemination, which will produce only female animals. This will reduce the number of male calves."

Earlier, *The Times of India* had reported on November 26, 2014, quoting executives of a dairy firm, that officials claimed they had already partnered with some of the country's premier institutes for developing this technology. In sexed semen, the fractions of the X-bearing (female) and Y-bearing (male) sperm are modified from the natural semen through sorting and selection.

More recently, *Business Standard* quoted a Union minister as stating that India will set up cow birth factories ("Ham gai paida karne ki factory laga denge"). He said that 30 lakh doses of sex-sorted semen will be given in a year and by 2025 there will be 10 crore female cows.

Further, on November 8, 2020 the *Business Line* reported that India now has an indigenous technology for sex-sorting bovine sperm which would ensure birth of only female calves.

Clearly, two notions are taken for granted by the promoters of this technology. One, that bullocks are not needed in India. Second, there is nothing wrong if a few persons decide to eliminate the further

advent of one gender of an animal, that too in the context of a species that has been extremely close to human beings since ancient times.

Let us check the first notion. Bullocks have traditionally performed several useful roles in villages. The foremost has been to plough fields, a role still performed in many villages. In addition, they have been used as a source of energy for irrigation and for food processing work. The bullock cart has been invaluable in rural transport, for carrying passengers, farm produce and other loads. In addition, the dung of bullocks has always been useful manure.

Due to these various roles, bullocks have been the pride of farmer and pastoral households and much affection was showered on them, just as on cows.



For thousands of years male and female species have lived together. Now a few persons want to stop one gender from entering the world.

This comes out in literature as in Prem Chand's *Do Bailon ki Katha* as also in its film version, *Hira Moti* (with beautiful Bhojpuri music). Bullocks and bulls are celebrated in Indian culture and mythology. Bullock races used to be the main sporting event in several villages.

Some of these activities still continue in many villages although with the advent of rapid mechanization and chemical fertilizers they have reduced in many other villages, mostly in the Green Revolution belts. However, there are reasons why the revival of bullocks may be practical and desirable in at least some villages where their numbers have reduced. In times of climate change

there are increasing reasons for shifting away from fossil fuels and chemical fertilizers in farming, and this may well signal the need for a revival of the many-sided useful role of bullocks in eco-friendly and organic farming, food processing and rural transport.

Second, it needs to be questioned whether some persons can take upon themselves the role of preventing the birth of bullocks. From where and how did they get the legal and ethical authority for this? Can some persons simply assign to themselves the role of preventing the birth of one gender of an animal species that exists in tens of millions? Such technology is being used to prevent the birth of male calves today. Tomorrow it can be used with some modification to prevent the birth of the male or female of any other animal. Where will it stop?

Before spreading this technology have its promoters thought about its various possible risks? As the ongoing pandemic has taught us at high cost, the entire issue of animal-human interactions has to be steered along a path of safety and least risk to avoid catastrophic events. For thousands of years in nature, male and female species have existed together. Now a stage comes when a few persons with myopic thinking say, Let us stop one gender from entering the world. Such human-imposed disruption of natural existence, which can be extended to other species, has the possibility of leading to highly undesirable and harmful consequences. What happens when only one gender is allowed to take birth and the other is not?

What about the quality of milk produced after this technology has spread widely? Has anyone carried out longer-term studies to rule out any adverse impacts? In case of quality loss or harm, who will be responsible? The role of science should be to contribute to better protection for both cows and bullocks instead of upsetting the entire balance.

It is one thing to think in terms of improving the usefulness of animals to human beings. It is quite another to go to the extent of saying animals exist only for human beings and if one gender ceases to be useful for humans it can be stopped from taking birth. This is a completely unethical view and crosses the limits of absurdity of human-centric extremism. It is not at all correct to say that bullocks do not have any useful role today. They do. But even if they did not have a useful role, it would be completely wrong to artificially gender contain the species. The sexed semen technology should be opposed widely and a ban sought before it can cause further harm. ■

The writer, a journalist and author, is honorary convener, Save the Earth Now Campaign. His recent books include 'Protecting Earth for Children', 'Planet in Peril' and 'Man over Machine'.



Jia and Nitin Pamnani (centre) with the iTokri team: 'We put up 200 to 300 products every day'

iTokri is in a sweet spot

It has got crafts from across India

SURMAYI KHATANA

IN 2012, when Jia and Nitin Pamnani moved back to Gwalior from New Delhi, they wondered what work they could do in their hometown. They loved the beauty and artistry of Indian craft and many of their friends were working with craft communities. So, they decided to set up iTokri, an online craft store. They pooled all their money, got friends and family to invest and took over Nitin's father's rice factory, converting it into a warehouse. Nitin jokes about how his father, probably sceptical of his venture, called iTokri another of his 'new ideas'.

Before he moved to Gwalior, Nitin was a documentary filmmaker, doing films on culture and politics. His documentary, *I am your poet*, on Ramashankar Vidrohi, JNU's campus poet, won an international award. Jia, a microbiologist, worked extensively with People Tree, a store that sells quirky T-shirts, art and offbeat books.

iTokri now works with over 10,000 artisans. It offers a vast array of sarees, fabrics, dupattas, stoles, and non-textile products like wooden and metallic jewellery, paintings, and home décor on its website.

"We are the only website that puts up 200 to 300 products every day," says Nitin. "While engaging with a craft community, we try to add all the crafts that their members make to our catalogue."

They have recently also started a 'Save the Craft' campaign to save 12 dying craft forms.

Travels across India, visits to craft festivals, melas, craft communities, and conversations with people working with these communities is what built their large network. COVID restricted travel, but word of mouth and an eight-year relationship with artisan communities has kept the business going and now iTokri finds people approaching them with their craftwork.

The products are divided according to their craft names and categories. They offer a range of sarees,

including hand-painted, embroidered, woven and tie-dyed sarees. Their handloom sarees include Kantha, Tangliya and Ajrakh, priced from ₹1,800 to ₹15,000. The silk-weave sarees have Shibori and Ikat art forms ranging from ₹4,500 to ₹15,000. Dupattas in Phulkari and Kalamkari are listed in many colours and styles. iTokri offers silver, metallic and wooden jewellery along with stationery and paintings.

Also available are fabrics from ₹200 per metre, in a variety of materials from cotton to wool. You can choose from Ikat fabrics, block-printed fabrics and naturally dyed fabrics, among others. And, if you want to be creative, you can buy hand-carved wooden blocks used for printing.

In home decor, there are pillow covers, bedsheets and bedcovers. Also in their catalogue are hand-painted coasters, wind chimes, tableware, utensils and decor items. A set of four coasters is priced at ₹850.

Continued on page 26

Continued from page 25

Beeswax solid perfumes and lip balms with uniquely painted lids can be bought at prices from ₹80 to ₹250. You can also find the perfect gift set of natural incense packed in wooden painted boxes, priced at ₹1,270.

During the COVID-19 pandemic, iTokri produced a range of pretty cloth masks which helped them tide over an especially bleak period.

GREEN BOX

When you buy a product from iTokri it arrives in eco-friendly packaging with a handwritten note on recycled paper. The packaging has its own story. In their search for ways to set themselves apart, Nitin and Jia came across box-makers in Gwalior who used to make cardboard boxes for local sweet shops. The sweet shops began buying factory-made laminated boxes, so the box-makers found themselves out of work. iTokri hired them to make hand-made boxes for their products which were unique and eco-friendly.

Each product lists which craft community or artisan made it and details its process, story and history. For some artisans, you can click on their name and find all the products they offer.

"A product becomes just a product when you don't know the people who made it and the labour that went into it," says Nitin. Connecting buyers to the process of production is important and this connection is being lost in big stores and malls, he points out. "When you know how communities get together to make some handicraft or the hours an individual has put in, *usme jaan aa jaati hai* (there is life in the product)."

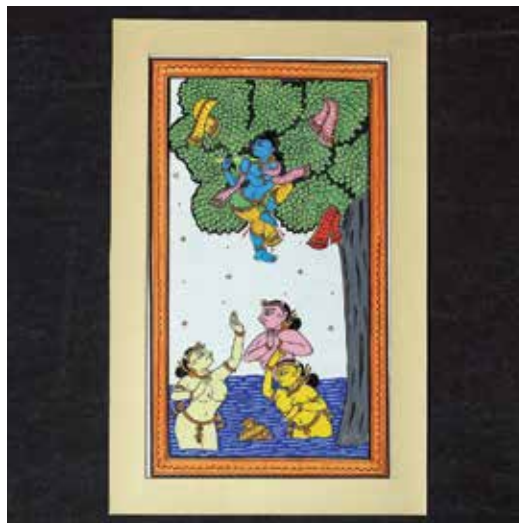
Sufiyan Ismail Khatri is an artisan who makes aesthetically pleasing Ajrakh stoles in Kutch. You can find out all about his life and expertise by clicking on his name on the website. Sufiyan is a tenth-generation artisan whose family has been involved in the art of Ajrakh printing since the 15th century. He became an apprentice at the age of 14. The website also details the process of production. Sufiyan's Ajrakh, for instance, is made through a 16-step process.

iTokri works on an inventory-based model where they purchase directly from artisans before selling. "We work on a procurement model. The artisan does not have to worry about sales and stock, they can relax and be secure because their sale has taken place," explains Nitin. The artisans set their own prices for the products and iTokri buys from them.

CRAFT CAMPAIGN

iTokri's 'Save the Craft' has shortlisted 12 dying craft forms from across India they want to support and revive. Each month, one craft will be the focus — starting with Ajrakh in February, followed by Sabai Grass from West Bengal, Chikankari from Uttar Pradesh, Kalamkari from Andhra Pradesh, Kasuti embroidery from Karnataka, Patachitra from Odisha, and six more handloom and craft styles.

"Our goal is to preserve the legacy of all-natural handlooms and handicrafts that are dying and promote it at all possible levels. We aim to sustain



Adding stitched clothing to the catalogue was something iTokri wanted to offer. They now offer kaftans, dresses, pants, kurtas and T-shirts, among other clothing, priced from ₹400 to ₹2,500.

the practice and prevent it from becoming extinct amidst fast fashion trends," says Nitin.

The idea struck them when they noticed an inflow of first-time customers who were new to the craft ecosystem. iTokri wanted to connect them to craft by providing information and seek their help in reviving dying crafts.

"At iTokri, we have a policy of selling the products in the name of the artisans, giving them due credit and recognition," says Nitin. "With this campaign, we hope that people will take notice of these artisans, support and encourage them to keep their efforts going." The campaign will include stories of artisans, live shows and collections.

The campaign is also a platform for deeper engagement with iTokri's long-term customers. iTokri has managed to create a loyal base of enthusiastic craft lovers. "Craft is a community-oriented product, so we are proud to have a consumer base which is also a close-knit family-like community," says Nitin. The consumers engage



with the website through reviews and discuss the crafts in comments.

While adding stitched clothing to the catalogue was something iTokri wanted to offer for some time, the nudge from customers' requests and feedback helped get things into motion. They now offer kaftans, dresses, pants, *kurtas* and T-shirts, among other clothing, priced from ₹400 to ₹2,500.

Most consumers are women and a lot of them are repeat customers. "People come back for our products, packaging or just the experience. We have had some people buy from us 50 times over a period of time!" Nitin exclaims. They rely on word of mouth from their happy customers and do some online advertising on social media.

iTokri also ships globally and 20 percent of their sales come from outside India. While iTokri sells mostly to customers directly, they also sell to small businesses and small stores, boutiques across India and internationally. The idea of a brick-and-mortar store in the future excites the Pamnanis. ■

<https://www.itokri.com/>

Walking into the past in Ahmedabad

SUSHEELA NAIR

ON a cold winter's morning, I sauntered into a maze of narrow lanes in Ahmedabad, India's first UNESCO World Heritage City, accompanied by a motley group of social media influencers from all over India. We were on a heritage walk in the walled city of Ahmedabad, a hoary place where the past is ever present. As we wandered through its historical streets, we could hear echoes of the past.

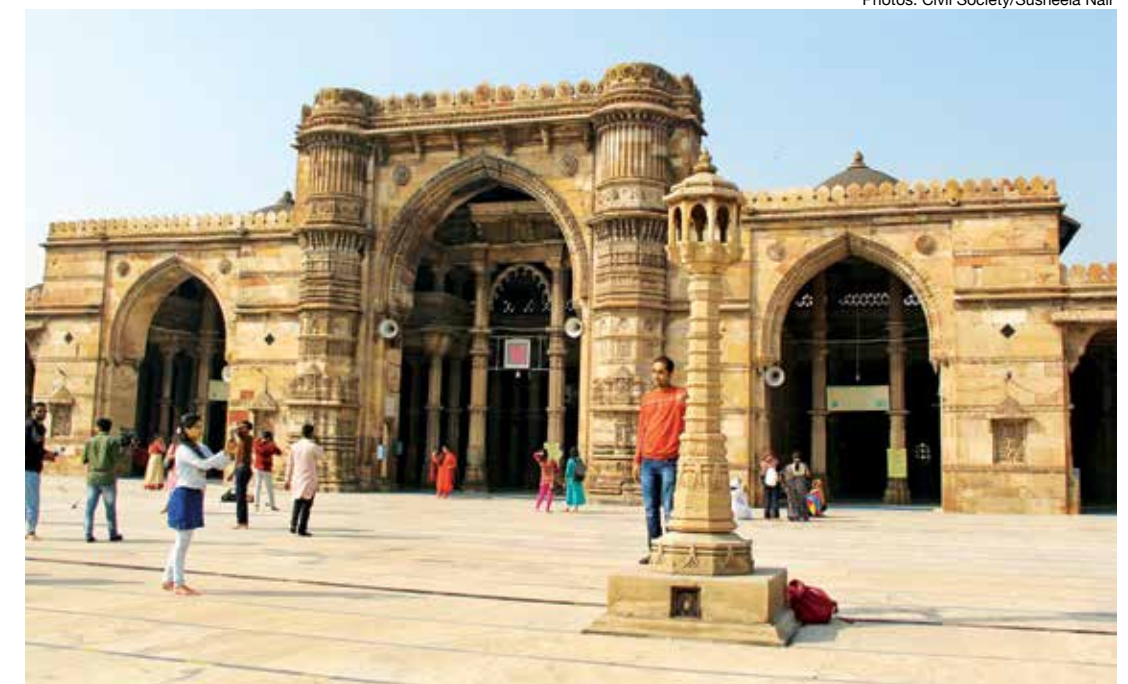
Ahmedabad is to be experienced rather than described. Right from the Siddhi Syed Mosque with its iconic Tree of Life lattice work, symbolizing the living heritage and longevity of Ahmedabad, to the majestic Bhadra citadel and the elegant carvings in the Hindu and Jain temples, the Indo-Islamic architecture and Hindu-Muslim art symbolizing unity, this historical city is a sight to behold.

There are poignant reminders of communal harmony here: a lamp burning for 600 years under the care of a Muslim family for Goddess Lakshmi in Teen Darwaza, the ceremonial gateway built by Ahmed Shah, the Queen's Tomb, a fusion of Jain, Hindu and Islamic architecture, and the Jama Masjid, with its Indo-Islamic architecture.

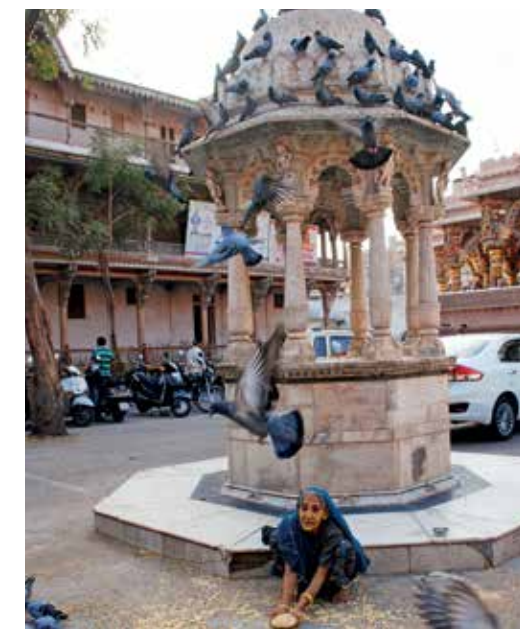
What makes Ahmedabad distinctive is that for over 600 years, it has stood for peace. A landmark city, this is where Gandhi began India's freedom struggle. Gandhi's Sabarmati Ashram defines tranquility. No matter which regime took over the city in the past six centuries — be it the Solanki or the Gujarati Sultanate, the Mughals or the British — the synthesis of architecture is something so special to Gujarat and Ahmedabad celebrates this. The intermingling of architecture is one of the key factors behind UNESCO's decision to list Ahmedabad as India's first World Heritage City.

We began our heritage city walk by going to the country's first Swaminarayan Mandir, built in 1850. It is a fine example of Maratha and Jain architecture. The opulent carvings that embellish every Burmese teak arch, wooden bracket and column add a splash of colour in the midst of the city's grey. From there, we were led by our guide through labyrinthine lanes to the bronze statue of Gujarati poet Dalpatram which sits in the porch of a replica of Dalpatram's original home in Lambeshwarni Pol. The Kathiawari embroidery on his kurta, the worn-out right foot and the meditative look in his eyes grabbed my attention.

The Old City is full of surprises and quirks like the *pols* which originated as a protection measure when communal riots necessitated greater security. These gated neighbourhoods, consisting of clusters of houses, comprise many families of a particular group primarily connected by religion and caste. Laid along narrow streets, each has its own security system, secret passages, public wells, *havelis*, bullion market and even a stock exchange. Equally amazing



Jama Masjid, the city's oldest mosque, is a blend of Hindu, Jain and Islamic architecture



A beautiful chabutara inside the Old City

are the well-entrenched systems of traditional rainwater collection, sewerage treatment, earthquake proofing and flood protection.

A *pol* is like a closed community which is called a walled locality within the walled city. *Pols* are akin to our contemporary gated housing societies. These neighbourhoods are both the backbone and heartbeat of the old city of Ahmedabad.

En route we passed by temples, community wells, and *chabutaras* or bird feeders built to rejuvenate the avian population. I saw some residents of the *pol* climb up and replenish grain and water for the birds in the *chabutaras*. I was overwhelmed by the public-spiritedness of the creators who realized the need for *chabutaras* for birds to nest due to shrinking space following deforestation. There are also parrot holes on the walls of houses to allow parrots to build their nests in the absence of trees. However, squirrels make more use of them than parrots.

At every corner, there was a surprise awaiting us like the Kala Ram Mandir which houses a unique idol of Lord Rama in a dark colour, in a sitting posture. It is believed that the idol resurfaced on its

own post-Independence — hundreds of years after the temple's priest had hidden it to protect it during the Mughal period.

Equally interesting is the Shanthinathji Mandir which flaunts an octagonal dome, brackets and pillars carved with musical instruments. The Sambhavnath Ni Khadki is an intriguing ancient Jain temple with an unassuming entrance, an open courtyard dominated by domes and a hidden place of worship in the basement. Intimidated by Muslim invasions, the temple had to be camouflaged. For those who cannot descend the steep steps, a mirror in the backyard offers a reflected image of the deity.

At Kuavalo Khancho, a street corner, the beauty of the various architectural marvels of Gujarat with Mughal, Maratha, English and Persian influences visible outside the houses of *pols* left us spellbound. We then walked through the historical Fernandez Bridge where a second-hand book market sells thousands of old college textbooks on carts. Just beyond the bookstalls are scores of shops peddling textiles, foodstuff, temple accessories, ethnic Indian wear, and so on.

Along the way, the Victorian-era Old Stock Exchange offers a contrast to the area's indigenous architecture. From there we headed to Manek Chowk, one of the most happening places in the walled city. This narrow lane wakes up as a vegetable market, then in the day transforms into a bullion bazaar bustling with shops selling gold bars, brass lamps and jewellery. At night, after the shopkeepers pull down their shutters, the street gets transformed into an open-air plaza, popular for its amazing variety of street food.

We culminated our walk in the serene Jama Masjid, one of the enduring landmarks of the city located in the midst of the chaos of Gandhi Road. Claimed to be the city's oldest mosque, it flaunts 256 pillars, intricate filigree work, Arabic calligraphy and an ablution tank in the centre of the compound. A unique feature of this mosque is that it has an amalgamation of Hindu, Jain and Islamic architecture. I returned entranced by its old-world charm, diversity and seamless blend of cultures and with the reassurance that heritage is definitely the essence of Ahmedabad. ■

From long years on the Hindutva beat, the real Ayodhya and Modi stories

RITA ANAND

WHEN Nilanjan Mukhopadhyay began reporting on the RSS-BJP-VHP combine in the 1980s, it was not a popular beat amongst reporters. Living in a flat in Delhi's Munirka, he would walk to the nearest Sankat Mochan temple where members of the Vishwa Hindu Parishad (VHP) often gathered for a *puribhaji* breakfast. Mukhopadhyay's impeccable Hindi — he hails from Western UP — his *kurta-pyjama* outfit and unobtrusive manner, put the VHP rank and file at ease. They spoke frankly to him. He says he was intrigued by them.

Since then Mukhopadhyay, now 61, has doggedly written on the Hindu right and closely tracked its strategies, agitations, politics, ideology and writings. He has interviewed the top leadership of the BJP-RSS-VHP as well as their cadres at the grassroots. An eyewitness of the exponential growth of the RSS-BJP and its affiliates, Mukhopadhyay realized early on the significance of what was unfolding. He never underrated the abilities of the Sangh Parivar.

His first book, though, was *Sikhs — The Untold Agony of 1984*, on the massacre of Sikhs after Indira Gandhi's assassination. In 2009, out of the blue, he decided to write a biography of Narendra Modi. Mukhopadhyay recalls calling up and telling him, "I want to write a book on you." Modi replied, "*Likhiye?*" "It won't be an authorized book," warned Mukhopadhyay. "When have you written anything authorized?" was Modi's cryptic reply. He did get to speak to Modi and spend time with him. But, he says, after he spoke to 'certain people' his access was blocked.

"You know, after my biography of Modi (*Narendra Modi: The Man, The Times*) was published in 2013, business houses kept inviting me for chats. Their understanding of Modi was that he would be a tremendous reformer. I laughed and said he is not going to be a Hindu Margaret Thatcher. And when Modi came to power in Delhi, the first thing he said was, My government is for the last man on the street. He committed himself to Antyodaya," says Mukhopadhyay. In 2019, he wrote *The RSS — Icons of the Hindu Right*, demystifying the RSS, plunging into its world and its most important personalities.

His recent book, *The Demolition and the Verdict*, is a masterly account of the Ayodhya issue right from the origins of the dispute to the demolition of the Babri Masjid and the Supreme Court verdict of November 9, 2019, handing over ownership of the disputed land to the Ram Janmabhoomi trust to build the Ram temple. Mukhopadhyay delves deep into the thinking behind the Ayodhya agitation, the politicians, the narrative, the strategies, and the aftermath of the demolition. The Ram Janmabhoomi movement was structured to gain political power and change the very idea of India and, thus far, it has succeeded.

The book is engrossing, combining research with journalistic flair. Mukhopadhyay, who says he really wanted to become an environmental journalist, has become instead India's foremost writer on the Hindu right.

With the success of the Ram Janmabhoomi agitation, is the Nehruvian idea of India as a plural, secular republic dead or has it just been tempered?

I definitely think that the world view of India that we grew up with from the 1950s and the dream at Independence have suffered a huge setback. Look at events just before the Uttar Pradesh (UP) elections — the BJP narrative of Ayodhya-Varanasi-Mathura, Arvind Kejriwal going to Ayodhya, starting a pilgrimage service, Mayawati beginning her campaign from Ayodhya, Priyanka Gandhi waving a sword at a rally in Varanasi, starting her speech with a Durga sloka....



Nilanjan Mukhopadhyay: 'Modi is no reformer'

I am agnostic but I have no problems with people being personally religious. But bringing religion into political and public life is something that has happened. Everyone is playing the same hockey game, shooting the same goal. You have no goalkeeper trying to save a certain territory. There is no one in public life saying that there is no harm in making the minorities feel secure. Or making the statement Manmohan Singh made several years ago at the National Development Council that minorities have the first right to the nation's resources. There is no harm in saying, Look, our Constitution says the majority has to work to make the minorities feel secure.

The dominant belief is that this is a country of Hindus. Muslims stayed back after Partition, that was their choice. Now, if they want to live here, they must do so on our terms and conditions. They must respect our ideas, ideals and iconic figures. Modi has said that and I quoted his exact words verbatim in his biography which I wrote eight years ago. This is now being said openly.

So everyone is following the BJP rule book?

Yes. Everybody feels there is greater acceptance of the Hindutva ideology. Even between 2004 and 2014, the Congress and its allies were not able to roll back any of the ideological gains the BJP made. Or narrow the widening of their base over several years including between 1998 and 2004.

Throughout the Ram Janmabhoomi movement, nobody could counter the strong narrative of the RSS-BJP — not the political parties, nor the Left, the liberals or the Babri Masjid Action Committee. Why?

See, the Babri Masjid Action Committee went to the other extreme. Because of that they enabled the VHP to mobilize people. That was one of the more serious mistakes they made. I've written about it in my book. Syed Shahabuddin later accepted in private that they should not have done so. Similarly, Shah Bano. I don't think the Rajiv Gandhi government should have capitulated. They should have stood firmly behind the Supreme Court judgment. It would not have given rise to the sentiment among Hindus that these guys are wavering.

A number of missteps were taken by the Muslim community too?

The Muslim leadership, not the community. The Muslim leadership was a contested territory in the 1980s. They were scattered across political parties but the bulk of the Muslim elite leadership was with the Congress since the 1950s. These leaders, after the Shah Bano case and the opening of the Babri Masjid gates, provided the opportunity for a new leadership to emerge. This was also

Photos: Civil Society/Umesh Anand

Monsters, spirits and fairies of Arunachal

CIVIL SOCIETY REVIEW

SERIOUSLY, are there monsters, spirits and fairies in Arunachal's forests? Tribal communities will tell you, of course there are and we have stories to tell about their adventures.

This slim publication, *Monster of the Golden Valley*, has 16 folk tales from Arunachal which reflect local understanding of human relationships, reverence for mountains, rivers, forests and spirits, and affection for animals. The stories also explain cultural beliefs, values and practices amongst the many tribes of Arunachal.

A story is, after all, more than just a story. Since time immemorial, people have told stories to entertain, enlighten and educate. Some were flights of fancy, others spoke of cold realities. There were gods, goddesses, heroes, villains, animals and spirits.

First collated and written in Malayalam by Sathyanarayanan Mundayoor aka Uncle Moosa, as he is affectionately known in Arunachal, the book has now been translated into English by Kairali Narayanan.

Uncle Moosa is well known for his stellar role in starting a community library movement in Arunachal. The Lohit Library Network he founded promotes books and brings young people together. A series of libraries has been set up in interior villages, where young people meet to tell stories, stage skits and celebrate special days like Environment Day or Women's Day.

Community libraries need books and Uncle Moosa hunted for good literature across India. He also decided to look closer: what were the stories the people of Arunachal told each other? Or sleepy children heard when their heads touched the pillow?

"We were looking for little gems of eco-wisdom, stories which would connect our children to their roots," says Uncle Moosa, explaining the journey of the book.

The book has a foreword by Mamang Dai, well-known poet, novelist and journalist from Arunachal. The Lohit Library Network has itself published the work. Hopefully, it will become a hub for local literature. There is a real need for people to tell their stories, relate their point of view, add to India's tapestry of stories and contribute to our understanding of local traditions.

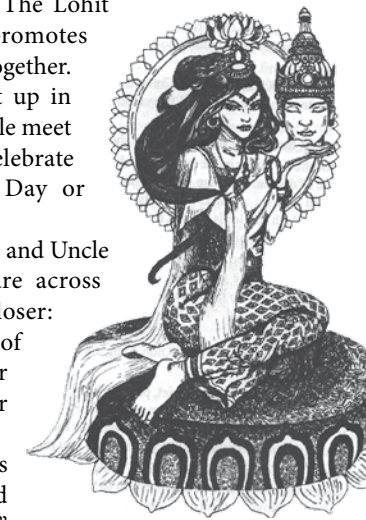
These are light stories simply written which any young adult or child would delight in.

The first story, *Why Everyone Loves the Moon* explains how the moon, which tormented people with heat, became cool and much cherished. *In Search of Queens* is about how two queens go missing and how a young boy tracks them in the company of spirits. The story explains the genesis of Ap Lamir, a dance celebrated by the Buddhist Sherdukpan community.

Monster of the Golden Valley is about a giant bird who terrorizes a village and the hunt to kill it. *Copycats! Beware* is about confrontation between a farmer and monkeys. And *Eat or Keep as Pet* is a compassionate story of a deer hunter. The story commemorates the famous deer dance of the Monpa and Sherdukpan communities.

The Curse of the Oppressed is about the angst of animals at the depredations of humans. A story belonging to the Wancho community of Tirap district, it explains how man squandered immortality.

This little book is a labour of love and can be a template for skits, dances and performances by children. ■



Monster of the Golden Valley and Other Tales from Arunachal Pradesh, Sathyanarayanan Mundayoor, Translation: Kairali Narayanan, Art Work: Indrim Boo, Lohit Youth Libraries, ₹80

the time when economic expansion among Muslims started taking place. They are also an intensely caste-divided society with Pasmanda Muslims at the bottom.

The new leadership that emerged, like Shahabuddin, started directly contesting with people like Imam Bukhari. The thinking was, the more extreme a posture I take, the more support I will be able to get from the Muslim community. It enabled the VHP to say, Look, the Muslims are ganging up against us.

The first time I heard the word 'reverse polarization' was in 1991. The discussion was with (K.N.) Govindacharya on elections in Muzaffarnagar which had a significant population of Muslims. They dominated in 20 to 25 seats. Govindacharya said it was good if Muslims were there in large numbers because Hindus were there in even larger numbers. We will tell them, Look, Muslims are getting together. They will polarize so we will reverse polarize.

Why is it in every speech, be it Modi or Yogi, the first point they emphasize is *danga*? It's because the rioter is synonymous with the Muslim or those backing them. So it's a vicious nexus they've created. Anyone who is not with the BJP is against the government, the country, against Hindu society and with Muslims and Pakistan.

Are there any chinks in the BJP armour?

Caste. It remains a major chink. During the Ram Janmabhoomi agitation the *trishul* became a political weapon. What does each of those prongs represent? The central one is anti-Muslim prejudice and communal politics. The second one is social engineering, another phrase introduced to us journalists by Govindacharya. He enabled us to decode the BJP because of his openness. The others wouldn't speak to us or would speak in such obtuse language that none of us could understand. At that time, most of us who reported on the BJP were essentially English-speaking, left-of-centre journalists of Nehruvian stock.

After the 1991 elections the BJP won a majority in UP. Kalyan Singh became the CM. He was a Lodh Rajput, an OBC, it was explained to us. The old-style politics began unravelling at this time after the Mandal award. Everyone was groping in the dark, trying to understand its long-term implications.

At that time my understanding of the Sangh was not sufficient. When I went back and read the Pune Vasant Vyakhyanamala lecture of Balasaheb Deoras (the third Sarsanghchalak of the RSS) where he talks of the need to broaden the social horizon of the RSS, I realized that's where it began. Yet, despite its commitment to widen its social base, the BJP still remains, in its basic orientation, essentially a *savarna* organization.

The third prong of Hindu nationalistic policy — social welfarism — has been devised by Modi. It was not there during Vajpayee's time. That is what has enabled a tremendous amount of support for the BJP — free food and MGNREGA. Money, under welfarism, is being doled out for political reasons.

The Indian economy is on a downward swing for the past five years. There is rising disparity. This entire system holds together because of a very strong political narrative which is: this is our country, I have given you a sense of dignity, restore your dignity so that a foreigner, an invader, cannot exploit you. This idea, that our present crisis is less important than restoring what we lost in the past, has become the dominant narrative.

How do you bridge this polarization?

An academic in the US who does all kinds of data analysis has analyzed Twitter engagements of some 15 to 20 leading Indian journalists at the top of Twitter engagements. Two important findings emerged: one, those who tweet in Hindi are doing better in terms of being followed. Second, the more aggressive and abusive you are, the greater your engagement. People like Barkha (Dutt) are falling behind. So the narrative is becoming more abusive in the country. That has to do with the coarseness that has been introduced in the past 10 years, which we have to take stock of.

Where do you see majoritarianism taking this country?

I think this is a cyclical process. There will be periods of conflict interspersed with periods when people will say: *Humko adjust karke rehna hai*. That sentiment will become dominant. This will continue alongside the vacating of public space by religious minorities. I see them receding into pockets. There will be occasional excessive bouts of localized violence but maybe not at the national level.

I don't see a reversal of the Hindutva narrative in a big way. Unless some political party forms an alternative government and has a clear idea of what has to be rolled back. But between 2004 and 2014 was there one decisive action the Congress took to recover lost terrain from the BJP? After the High Court judgment of 2000 on Ayodhya, what did the Congress do? It did nothing. ■

The deep forest and its many treasures

Catching up with the hornbill

CIVIL SOCIETY REVIEW

IT was the search for plants that hornbills feed on which brought Navendu Page, a botanist and wildlife expert, to the Pakke Tiger Reserve in Arunachal Pradesh. Dr Aparajita Datta, a senior scientist with the Nature Conservation Foundation, was studying hornbills with her student, and needed a helping hand.

“Hornbills are predominantly fruit-eating birds. Almost 60 to 70 percent of their diet consists of fruits. The Northeast, and Pakke in particular, has three or four species of hornbills. Although Aparajita had identified many plants the birds feed on, they never had a botanist go there and formally identify all of them,” explains Page.

With its misty forests, gorges, rivers and wildlife, Arunachal is a paradise for plants. A mosaic of indigenous tribes adds to its allure as a destination for travellers and tourists. Located at the junction of Myanmar and China, the state has the largest forest cover in India after Madhya Pradesh.

“One of the first forests I explored in detail was in Arunachal. And I was absolutely mesmerized, blown away, by the huge diversity of plants the state has. It is by far one of the most biodiverse states in our country. It’s also one of the least explored,” says Page.

As Datta and Page began their floristic explorations, they realized that the state’s plant life had barely been documented. For the lay reader, there was nothing. That’s how the idea of doing a book took root. Their third co-author, Bibidishananda Basu, also of the Nature Conservation Foundation, joined as an intern and proved himself so useful he became a co-author.

The explorations of the three intrepid field biologists into Arunachal’s forest ecology, spanning two decades, is contained in this book, *Trees of Arunachal Pradesh*. Attractively designed, it has 1,500 pictures of 241 species of trees, shrubs and climbers mapped by them. Also included are flowering and fruiting times, who eats the fruit and how seeds are dispersed, explains Datta.

The book is easy to use with ‘keys’ to help the reader navigate. “These ‘keys’ are based on easily observable characters such as leaves, flowers and fruits. They provide pointers to compare similar-looking species, helping to get past the lookalikes and identify the plant of interest quickly and accurately,” explains Page.

To ensure local people can use the book, the authors have included names of 18 different languages of the northeastern

states, including Nyishi, Idu Mishimi, Adi, Apatami and Lisur from Arunachal. There are names in Bengali and Nepali for some species as well.

Why is Arunachal’s ecology so unique? Because it has a large family of plants from Southeast Asia, China, Myanmar as well as central India, all living in happy unison.

“It’s unique, like the rest of the Northeast, in terms of its species composition and huge number of species,” says Datta. “The region is contiguous with Southeast Asia which is part of the Indo-Burma floristic region. So, in terms of species composition, the Northeast is very different from the rest of the country.”



The splendid hornbill perched on a branch

Arunachal also has a wide gradient in elevation, meaning you have forests that range from as low as 100 m to 3,000-4,000 m. So you get to see distinct vegetation types. And with that comes a great diversity of plants.

The book is not the last word on Arunachal’s plant ecology. There are approximately, say Datta and Page, around 6,000 to 7,000 flowering plants and taxonomists are constantly discovering new species. The book covers woody plant species in the tropical lower elevation forests. Their numbers are quite high, says Datta. There are no uniquely temperate or subtropical species in the book.

There is also information on habitat, dispersal modes as well as flowering and fruiting periods. It is mostly birds who disperse seeds here and then mammals and not wind or gravity so much.

“For 20 to 25 years, we’ve done a lot of studies on plant-animal interactions,



Trees of Arunachal Pradesh; Navendu Page, Aparajita Datta, Bibidishananda Basu; Nature Conservation Foundation ₹1,000



The state is a hub of research efforts on hornbills and plant ecology

Arunachal’s ecology is unique because it has a family of plants from Southeast Asia, China, Myanmar and central India all living happily together.

especially seed dispersal and frugivorous. We found that, in Pakke Tiger Reserve, 78 percent of tree species are animal-dispersed. Out of that, at least 40 to 50 frugivorous bird species are important. Bird-dispersed species are really represented in the forest,” says Datta. “The threat or conservation status of a species assigned by the International Union for Conservation of Nature (IUCN) is also provided in the book.”

Arunachal is, in fact, a hub of research efforts. It has a Hornbill Research and Conservation Programme and a Hornbill Nest Adoption Programme. Scientists here are working with local communities to protect hornbill nesting habitats outside the Pakke Tiger Reserve. “We have a forest restoration project and a nature education programme as well. Most field staff is from local villages. Their involvement is what makes the programme a success,” says Datta. A hornbill



Aparajita Datta



Bibidishananda Basu



Navendu Page

festival is organized in Nagaland every year.

The threat to this treasury of plants is from road building and plantations, especially palm oil. People need roads, says Datta. There has also been a transition from agriculture to the formal economy. The problem is that roads are being built without guidelines. During the monsoon, landslides occur, the road crumbles and the rubble is dumped, damaging entire slopes of forests. Cash crop plantations, like palm oil, subsidized by the state, are being promoted. Experiences in Mizoram show these are unsuited to the ecology of the state.

Local species like *Livistona jenkinsiana*, Himalayan fan palm, and *Phoebe cooperiana*, a *lauraceae* family fruit tree, dispersed by hornbills, could be promoted, says Datta. *Phoebe cooperiana* is prized by locals and is becoming quite rare because of overharvesting.

“A lot of people love the fruit. During the fruiting season they pay a huge amount for a small bundle of fruits. It’s a very important timber tree also. It doesn’t fruit every year. Many people are already growing it in their home gardens,” says Datta.

Another option is medicinal plants. Arunachal

has some 500 species of medicinal plants used by indigenous communities. Many of these have already been mapped. The Apatami tribe in Ziro valley uses as many as 158 medicinal plants.

“I think agroforestry, where people plant a mix of native species, could be an income earner instead of monoculture plantations,” says Datta.

The problem is that the incentives provided by the state for monoculture palm oil lure people away from native species. Environmentalists fear the slow denudation of Arunachal’s magnificent forests. The book is timely. ■

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IMPROVE HEALTH SERVICES AND INFORMATION

 Sambhav Social Service Organisation is a voluntary organization that tackles violence against women, education and health. Sambhav works with the Sahariya tribe and with urban slum dwellers in the Chambal region of Madhya Pradesh in capacity-building. Their programme, Aarogyam, helps to improve access to community health services and information. It also tries to improve the quality of health services. Another project, Sabla, being implemented in the urban slums of Gwalior, focuses on prevention of violence against women and on building their capacity to respond. Sambhav also helps the Sahariya community run a grain bank at village level. You can donate to their efforts. www.sambhavindia.org | sambhavngo@gmail.com | +91-7415764492

BE A DOCTOR TO THE POOREST

 Swasthya Swaraj believes in promoting self-reliance in health. It tries to ensure access to health services for the poorest communities in remote tribal areas. They advocate community-based research on unique health problems in tribal pockets and find solutions for them. The non-profit's Comprehensive Community Health Programme is active in 79 villages in 10 panchayats of Odisha, and covers 4,000 people. It works in Thuamul Rampur block of Kalahandi district, one of the most deprived regions in India. The non-profit runs two health centres which provide 24/7 emergency services, including deliveries, surgical procedures and OPD services. They specifically work on malaria prevention through training, creating awareness, screening and indoor residual spraying. Swasthya Swaraj appoints nurses from the local population for community engagement. It also offers a Tribal Health Fellowship for young doctors. You can donate to help their efforts or volunteer with them. swasthyaswaraj@gmail.com | info@swasthyaswaraj.com | 06670 295476 | 7326874618

'MY WORK WITH TROUBLED BOYS WAS VERY ENRICHING'

FIRST PERSON


Dr Mridula Seth, retired teacher

I WORKED as a volunteer with the Society for Promotion of Youth and Masses (SPYM) from 2011 onwards, leading their project on literacy, life skills and library called *Padai Ka Maza*. I was dealing with adolescents who had been addicted to drugs and in conflict with the law. Most of the boys were dropouts. I had been a teacher at Lady Irwin College in Delhi and a technical adviser on adolescents and youth to the UNFPA. But this experience as a volunteer after my retirement was uniquely enriching. I got involved with SPYM when I first met the boys at the rehab centre and asked them to raise their hands if they wished to learn and




work in the area of substance abuse and prevention. The freedom to experiment with different strategies has been very rewarding. I strongly believe in partnerships between NGOs and academic institutions. My association with Lady Irwin College helped me get faculty and students involved with SPYM in capacity building. I was sensitized to the circumstances that drive children to indulge in anti-social activities and substance abuse. Poverty, lack of education and dysfunctional families are the root causes of the problems that SPYM is dealing with. One has to empathize with the children to work out effective strategies for bringing about change in their attitudes and behaviour.


FIGHT ALL FORMS OF DISABILITY

 Prabhat works for the welfare and rehabilitation of people with disabilities and people with mental illness. It provides access to cost-effective care and therapy. Along with vocational training it organizes job fairs to help people with disabilities find employment. Prabhat has been working since the last seven years to provide a support system for people with disabilities. Prabhat also organizes awareness programmes to fight stigmatisation of mental health for parents, teachers, students, community leaders and local government representatives on mental health and disability. Their Abdul Kalam Project is a school on wheels for children with disabilities for skills and activities. They are currently working on establishing a day care and residential centre in Panchkula, Haryana. You can donate to Prabhat or help them with their job fairs, awareness drives and vocational activities. www.prabhatngo.com | opasija1940@gmail.com | +91 94631 25184

HELPING HAND FOR ALL DISTRESS

 Samarpan Foundation, a charitable non-profit entity, provides support and assistance of any kind wherever there is a humanitarian, ecological, environmental or animal welfare need. Samarpan Foundation runs mobile medical clinics in the Sundarbans for 250 patients of all ages with various medical conditions. It provides emergency medical relief and specialized medical care, including an eye clinic. The foundation runs a women's centre in Guwahati which helps migrant families from Bihar, Bengal and Manipur. They also have two children's homes in Delhi. You can donate to specific projects run by Samarpan or donate to the foundation. You can also volunteer for their projects in Delhi, Bengaluru, Guwahati, Mumbai, Goa and the Sundarbans. www.samarpanfoundation.org | volunteer@samarpanfoundation.org | donate@samarpanfoundation.org

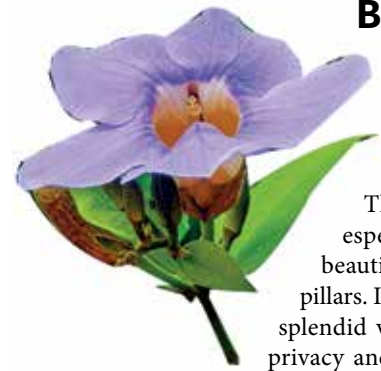
ENSURE THE RIGHTS OF CHILDREN

 HAQ works for the recognition, promotion and protection of the rights of children. The non-profit organizes campaigns against child trafficking, child labour, violence and abuse to actively engage in public education and advocacy on children's rights. HAQ also seeks to serve as a resource and support base for individuals and groups dealing with children. They provide training and capacity building for law enforcement agencies and other institutions that come into contact with children on a regular basis. HAQ supports children in conflict with the law by providing legal aid and counselling to victims of child abuse. HAQ also undertakes research to mainstream children's concerns into developmental planning and action. They release a Child Rights Index and special reports on child soldiers and children in mining in India. Donate to HAQ to help their efforts. You can also volunteer or intern with them. www.haqcrc.org | training@haqcrc.org | info@haqcrc.org | Phone: +91-11-26677412

PLANT POWER

Flowers and plants almost always capture our attention. We wonder what their names are, where they originate and what they could be useful for. There are rare plants we may never see. Ganesh Babu, a botanist, is our guide.

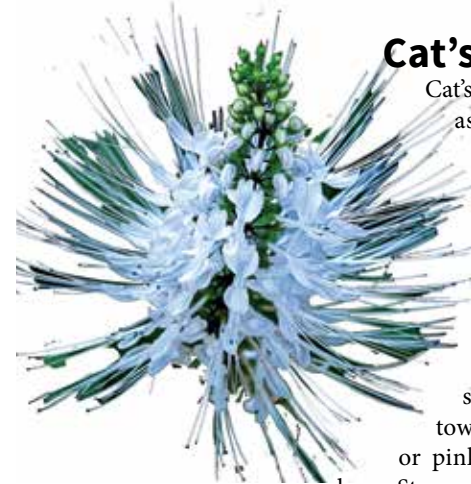
Bengal Clock-vine



Thunbergia grandiflora (Roxb. ex Rottl.) Roxb is native to north and north-east India, hence it is called Bengal Clock-vine. The plant is known for its showy habit and it grows and multiplies quickly. This genus is also an ideal climber and is especially suited for decorating wire fences, beautifying trellises and dressing up walls and pillars. It can be used as a colourful screen. It adds a splendid vertical dimension to a garden and offers privacy and shade. Its spill of bluish-purple flowers with green foliage provides a delightful look to hanging

pots. Bengal Clock-vine is a heavy twiner and needs very tall support. It blooms intermittently throughout the year. This climber is the best choice to perch on tall trees, on high roofs and high-rise buildings. It is a dazzling beauty with decorative foliage and colourful, ethereal blooms.

Cat's Whiskers



Cat's Whiskers is scientifically known as *Orthosiphon stamineus* Benth. (Syn.: *O. aristatus* (Blume) Miq and it belongs to the tulsia family.

Cat's Whiskers is a perennial herb, 30 to 60 cm tall. Inflorescence is in close-whorled, pyramidal kind of racemes at the end of the branches, up to 20 cm long and six cm broad at the base, narrower towards the end. The flowers, white or pinkish purple, are about three cm long. Stamens are very prominent and longer

than the corolla. The leaves of Cat's Whiskers are said to have diuretic properties and increase uric acid excretion, therefore tea, popularly known as 'Java Tea', is prepared with these leaves and used in the treatment of kidney and bladder diseases. The aerial part of the plant is reported to reduce blood pressure.

Cat's Whiskers is excellent for creating flowery borders and very long hedges. Its lovely colour and tasty nectar attract butterflies and a variety of birds, and keeps the garden alive. Its white flowers with long, pink-shaded stamens look like a cat's whiskers and beautify gardens. It is also suitable for containers and planters.

Rosy Milkweed Vine



Plants which do not need to climb on any structure for support but use their stems to twist around what they sense and touch are classified under climbers as twiners. *Oxystelmaesculentum* (L.f.) Sm is one such twiner which grows very fast in tropical climate conditions. It is commonly called Rosy Milkweed Vine but it never grows like a weed. It is a very pretty and slender laticiferous climber with beautiful, bell-shaped pinkish-white flowers. Its fruits are paired follicles, inflated. Adding this twiner

on a trellis or any other vertical structure enhances the landscape since the plant flowers profusely. Its growth and corpus of colour give a charming appearance when it is planted inside ponds or along streamlets. It is used in the treatment of ulcers, cancers, kidney disorders, sore throats and itching.

Wavy Trumpet



Wavy Trumpet is a deciduous tree which grows up to 20 m and exhibits large trumpet-shaped flowers from its terminal, velvety pubescent branchlets. The flowers are flawlessly white and look very attractive against its bright-green foliage. Wavy Trumpet flowers from August to October. The flowers are mildly fragrant, an added advantage for landscaped gardens or avenues. Fruits are snake-like, dehiscent capsules up to two feet long.

Wavy Trumpet is a fast-growing tree and doesn't spread its crown extensively. Hence, it is best suited for urban avenues. It can add beauty to compound walls, if planted densely. It is a hardy plant and does well in open or partial sun, in mild as well as hot climates. Wavy Trumpet is endemic to tropical thorn and dry deciduous forests of western peninsular India.

Mysore Mallow



Croton Leaf Mysore Mallow is botanically known as *Decaschistia crotonifolia* Wight and Arn. It is a wild relative of the hibiscus and looks heavenly. Mysore Mallow is a shrub that grows up to five feet in height. It has woody stems, and its branches are whitish and woolly, very soft to touch.

The flowers are large and bright yellow with a deep maroon centre up to eight cm across. Its croton-like leaves and showy flowers make it an interesting addition to gardens. Its yellow buds with crimson red ridges are amazing to look at against sunlight. Mysore Mallow can be planted in rows or in broader beds on lawns. It can even be grown in containers. The plant is used as an antiseptic and antioxidant. Mysore Mallow is commonly found along dry deciduous forests and grasslands. This species is endemic to peninsular India.

Ixora



Ixora (s) is grown for its showy flower clusters. Each cluster is very dense, containing many individual, tubular flowers with four petals at the top.

Ixora coccinea L. grows wild in our country. Its flowers are a brilliant red to orange-red and its fruits are shiny, fleshy berries with one or two seeds, similar to fresh coffee fruits.

Ixora is not only visually attractive, it also possesses many medicinal properties. It is considered a holy plant, especially in Kerala where it is known as *chetthi* or *thetchi*. Puja rooms are decorated with these plants and they are also used extensively during religious festivals. *Ixora* also looks pretty in flower vases. *Ixora coccinea* is a sun-loving plant but also grows as an understory in evergreen forests, hence it can be planted in partial shade too. ■



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