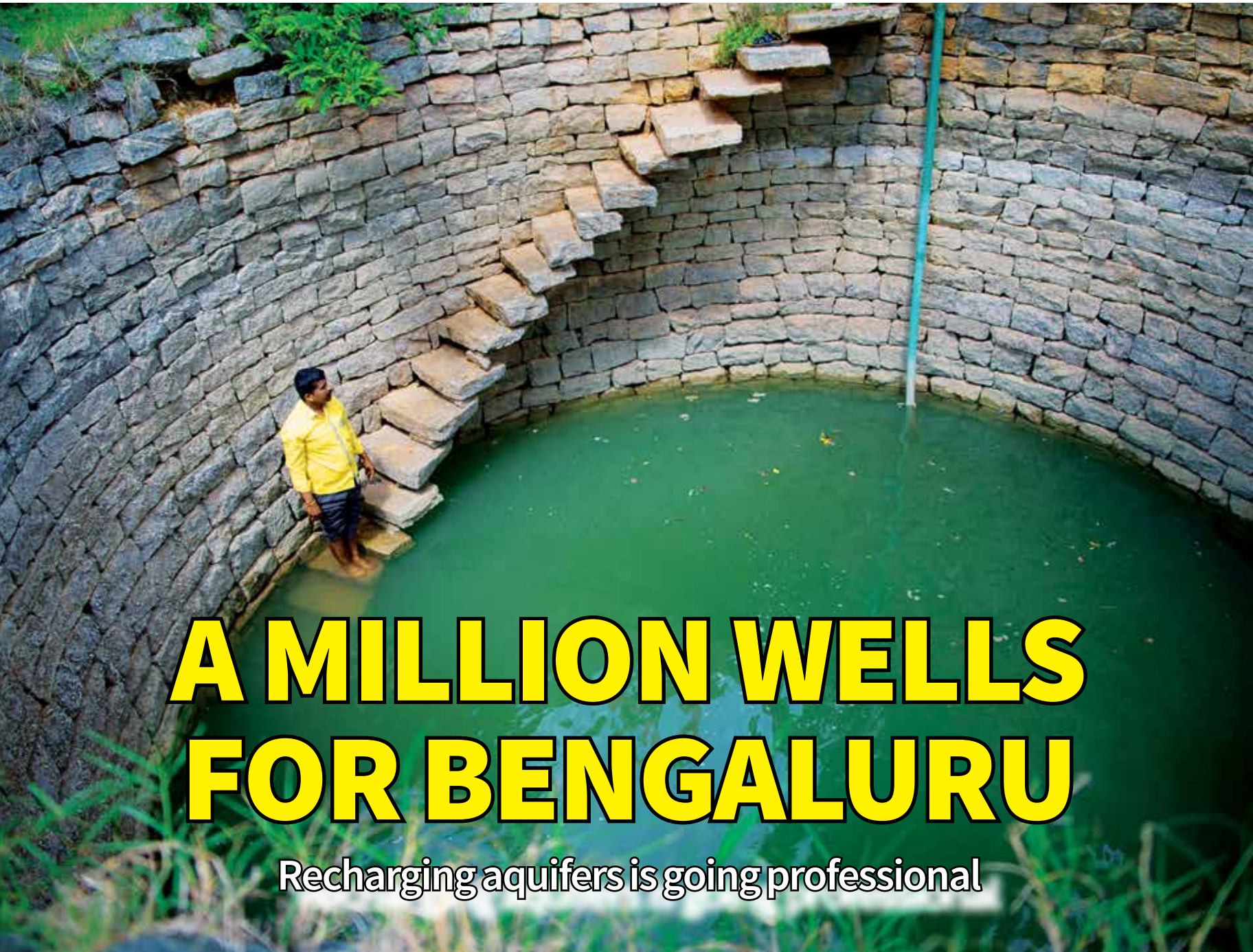


Civil Society



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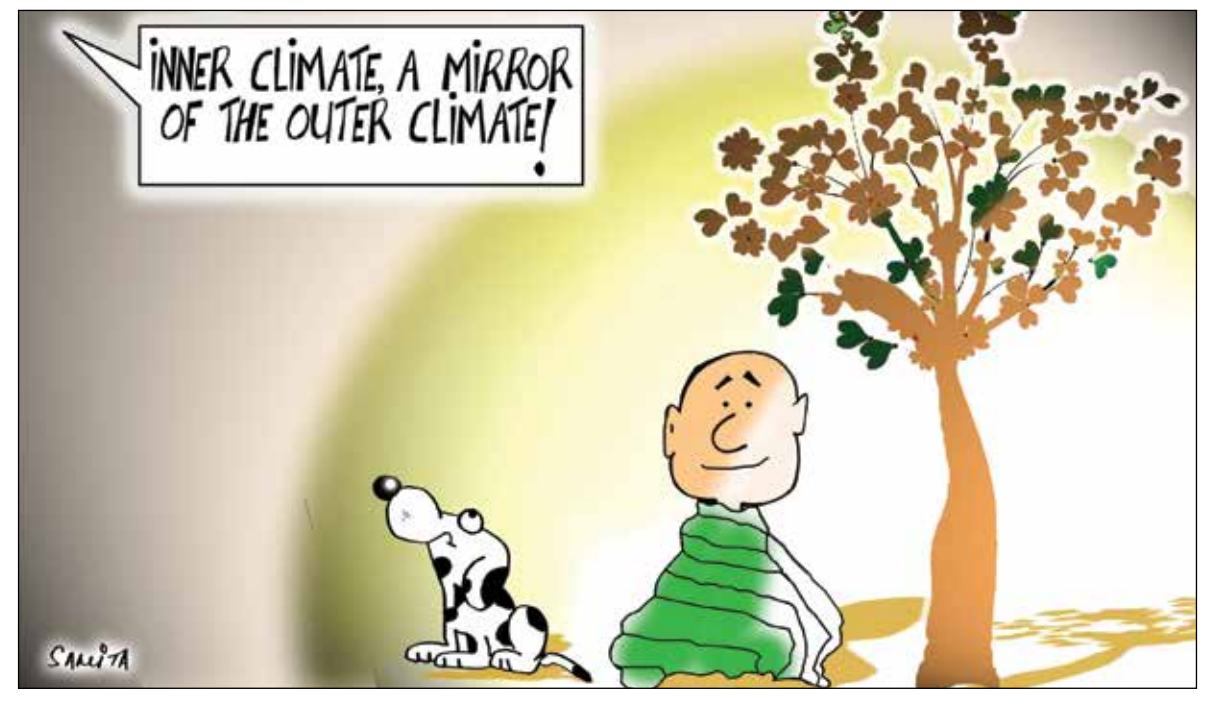


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IN THE LIGHT

SAMITA RATHOR



LETTERS



Hall of Fame

Hearty congratulations to *Civil Society* on your 16th anniversary. What a great service you provide by spotlighting the good work of so many people who are changing lives for the better across a variety of sectors and all over India. Thank you also for the recap this issue provided. These are the kind of insights we have come to rely on from this very special publication!

Deepthi Kharod

Anupam Mishra's inspirational books gave confidence to a wide swathe of society to collect and conserve water. This kind of impact is so unprecedented and unique. His simplicity and deep understanding of water, environment and society along with his gentle humour brought us so close to him. He was not just a 'water guru' but a guru of many of

us. My gratitude to *Civil Society* for remembering him.

Kabir Vajpeyi

A million congratulations for being and staying so doggedly unique. We are proud to have been a small part of your journey. The magazine is holistically brilliant. So proud of you.

Kamini and Kabir Mustafa

River from hell

Thanks for Raj Machhan's piece on the filthy Buddha nullah which flows through Ludhiana. It is the duty of the Ludhiana Municipal Corporation (LMC) to treat the sewage and effluents released by citizens and industry respectively. The LMC

collects crores of rupees by imposing taxes for cleaning this wastewater. I appreciate your concern for our Buddha Dariya but I can also say that no one will treat the dirt that is dumped in there.

Satwant Saini

I have approached the officers of the Punjab Pollution Control Board to help them clean the Buddha nullah but I have received no response.

Dr Suhasini Bhatnagar

Delhi's water

Thanks for the interview with the Delhi Jal Board's (DJB) technical adviser, Ankit Srivastava, on reviving Delhi's water bodies. It seems like a

good plan. However, citizens too should be involved in such efforts. To do so the DJB would require a plan to create awareness. We would be happy to hear of Ankit's ideas on citizens' engagement in water conservation.

B. Shadrach

Clean air

I read your piece on battling Kolkata's air pollution titled, 'Gargi and Ajay fight for clean air.' In my opinion, people should be encouraged to use electric cars and buses. There should be incentives to divert buyers away from petrol and diesel cars. Carpools are a good option. Also, more trees can be planted along boulevards.

Kallol Das

To combat pollution, no city with a population of more than 500,000 should be permitted to construct new commercial buildings. Buildings which are more than 25-35 years old should be demolished and fresh permissions obtained with strict pollution norms and green standards.

T.L. Prasad

Dream holiday

I enjoyed reading Susheela Nair's story, 'Istanbul and its many charms.'

I have visited that city thrice and enjoyed seeing all the places she describes. Plus I went on the Bosphorus sea cruise in the evening. I was very proud to see the Takht-e-Taus, which originally belonged to Indian rulers in Delhi, kept well-preserved in the Istanbul museum behind a glass cover.

Jatinder Yakhmi

Letters should be sent to response@civilsocietyonline.com



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A MILLION WELLS FOR BENGALURU

The high-tech city's freedom from water scarcity lies in traditional water harvesting. It is the same for other cities and rural areas and new expertise is customising solutions to meet specific needs.

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Cheque to: **Content Services and Publishing Pvt. Ltd.**
Mail to: The Publisher, Civil Society, A-16, (West Side), 1st Floor, South Extension - 2, New Delhi - 110049.
Phone: 011-46033825, 9811787772 E-mail to: response@civilsocietyonline.com
Visit us at www.civilsocietyonline.com

Publisher
Umesh Anand

Editor
Rita Anand

News Network
Shree Padre, Saibal Chatterjee, Jehangir Rashid, Susheela Nair, Kavita Charanji

Desk & Reporting
Rwit Ghosh
Sidika Sehgal

Photography
Shrey Gupta

Layout & Design
Virender Chauhan

Cartoonist
Samita Rathor

Write to Civil Society at:
A-16 (West Side), 1st Floor, South Extension Part 2, New Delhi -110049.
Phone: 011-46033825, 9811787772

Printed and published by Umesh Anand on behalf of Rita Anand, owner of the title, from A-53 D, First Floor, Panchsheel Vihar, Malviya Nagar, New Delhi -110017.
Printed at Samrat Offset Pvt. Ltd., B-88, Okhla Phase II, New Delhi -110020

Postal Registration No. DL(S)-17/3255/2018-20.
Registered to post without pre-payment U(SE)-10/2018-20 at Lodi Road HPO New Delhi - 110003
RNI No.: DELENG/2003/11607
Total no of pages: 36

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Umesh Anand



SHREY GUPTA

Pradip Krishen: 'You have to grow trees that belong to Delhi's ecosystem'

'Delhi's Central Ridge could be a most beautiful urban forest'

Pradip Krishen on bringing back indigenous species

Civil Society News
New Delhi

PRADIP Krishen is a home-grown expert on trees. Insightful and sensitive to cultural influences, Krishen breathes life into botanical knowledge. His popular book, *Trees of Delhi*, is perhaps the only one of its kind on green cover in an Indian city.

A filmmaker, Krishen, now 70, began researching trees when he hit a lean patch in filmmaking. Literally, he saw from the window of his beautiful house in Chanakyapuri a tree which had always been there but whose name he didn't know.

From then to now has been a memorable journey, which has taken Krishen all over India and across continents. Most recently, he has been greening the desert in Jodhpur and Jaipur by helping nature restore itself.

Civil Society spent a morning with Krishen in his

tightly packed study for some tree talk over coffee and tea. It was a long conversation and what appears below is mostly on Delhi where citizens' concerns over losing their trees have been growing as in Mumbai and other cities.

People are becoming increasingly concerned about trees in their cities. Delhi, in comparison to, say, Mumbai or Chennai, is still quite green. What is your impression today of Delhi's current green cover?

Lutyens' Delhi is green, unusually green, shall we say. Some of these trees are going to start failing because as our water table drops further, trees are going to start struggling.

The rest of Delhi isn't quite so green. Look at the Central Ridge. It is 900 hectares, a huge chunk of territory. Almost 96 to 97 percent of it is overrun by *vilayati kikar* (*Prosopis juliflora*), an exotic, invasive species introduced by the British.

This happened due to an ecological misunderstanding or naiveté. The first eight species that were planted on the ridge were not native to rocky, thin-soiled areas. They were the wrong species. So the minute they stopped being watered, they died.

If you look at Delhi from a satellite or an aeroplane, the Ridge will look green. But it is a degraded forest.

Which species would you replace on the Ridge?

The species that you would get in a dry, deciduous forest in Delhi. There are some 28 such species on the Ridge. When I take people for a walk to the Ridge, there is a particular place, for reasons that I don't fully understand, where *vilayati kikar* stops growing. That creates an opportunity for native species to exist. It's not as though those indigenous species were planted there. They grew there on their own.

So you'll get *amaltas*, a species you get in a dry, deciduous forest. You will also get *bistendu*, a very beautiful smallish tree that has been planted ornamentally on Vijay Chowk where it is trimmed high. It is the only native species that has been used in Lutyens' Delhi. You also have the *hingot* tree. It sends out suckers and new plants emerge. Once *hingot* establishes itself, the *chudail* or Indian elm takes root. You get *Ehretia laevis* or the *chamrod*.

I have counted 28 species that you could expect on a rocky, ridge-like area. You have to adjust tree species according to the substrates you have.

According to the ecological zone.

According to the soil and availability of water, yes.

Sunder Nursery had done something similar.

I joined them for a year and a half in 2009 or 2010. They asked me to help create an arboretum. In my book, *Trees of Delhi*, I have said that you can divide Delhi into four and a half micro-habitats, which correspond almost exactly to what the Mughals might have done in Delhi. The Mughal state had an interest in assessing the quality of land and its productivity, and levied land revenue accordingly.

So if you owned land in Malcha village, for example, where the soil is rocky and ridge-like, no revenue was assessed at all. It was regarded as *gair mumkin zameen*.

The *bangar* area, on the other hand, which had rich soil and water close to the surface, was regarded as land with the highest productivity. The *bangar* was the old floodplain of the Yamuna which was subject to periodic flooding. Then there was the *khadar*, the riverine area between the banks of the river which had its own ecology. The Ridge was called the *pahadi* or *kohi* area. Finally, you had *dabar* which was the salt-affected area, primarily the Najafgarh *jheel* and its surrounding area.

These four are actually very good sub-divisions of Delhi's ecological habitats. Each of them still has a few trees with the resilience to grow in that area.

I think 900 hectares of the Central Ridge has the potential to become one of the most beautiful natural forests that any capital city has in the world. It will take a lot of money, effort and design sense along with ecological familiarity and knowledge. I don't think all those factors exist in any agency at the moment. Certainly not in the forest department.

Unfortunately, there has already been an attempt by Dr C.R. Babu and the Delhi Development Authority (DDA) to start something on the Ridge. I feel very sad about it because Dr Babu's work (as head of the Centre for Environmental Management of Degraded Ecosystems) with the biodiversity parks that I've seen does not inspire confidence. It is not aesthetic. He knows his species well but does not plant them in a manner that simulates a natural dry forest.

For the DDA and Dr Babu to now redo the Ridge at this stage, given what we know about the way they work, think and design, is to prick that bubble of hope of the Ridge becoming a beautiful place.

But the Ridge could become a showpiece for Delhi.

There are a lot of models of what the Delhi Ridge could be like. When I first discovered Mangar Bani in 2002-03, I was completely thrilled because right

here at Delhi's doorstep was a template for what the Ridge could be like. Utterly beautiful and sustainable.

It is a sacred forest because the Gujjars who live in Mangar Bani and two adjoining villages consecrated this forest in the memory of a *baba* who was a holy man for them. They let it be known that whosoever breaks a twig in that forest, great harm would come to him and his family. They were the only people who lived there. Those villages are entirely Gujjar. They are pastoralists, who own cattle, goats and buffalos. When the *chor* becomes the *kotwal*, it is very effective.

Mangar Bani is under enormous threat?

It is but it is still worth a visit and it is still amazing.

What about indigenous grasses in Delhi? There has been renewed interest in grasslands in recent years.

For me, the big learning about grasslands happened in the desert. In 2006 I was given a 70-hectare plot of rocky land next to Mehrangarh Fort and asked if I could revive it. I've been doing that since then. We travelled a lot in the desert looking for seeds of

'Thirsty trees are not sustainable in Delhi's ecosystem. The biggest problem Delhi faces is the scarcity of water. You grow the wrong kind of trees and then use water in a stupid way.'

plants that are adapted to grow among rock.

We found grasslands extremely productive, beautiful and important. Not just for themselves, but also for all the creatures they support.

In Delhi, there are no habitats left that could be grasslands. They are more like thorn forests. The words 'thorn forest' have a slightly pejorative sense, but I don't mean it like that at all. I think originally, Delhi would have had a mosaic of habitats among which there would have been grasslands but there are none left, or none that I have seen. But grasses, as components of ecosystems, are very important.

Jodhpur, which is much drier and rockier than Delhi, has a volcanic substrate where I work. The rock is called rhyolite, harder than quartzite. There is no soil there except at the bottom of valleys and in the cracks between rocks.

We have 72 species of grasses there that are native to the rocky desert and lithophytes. They play a very important role and are visually very attractive and an important component of the landscape.

People talk about growing trees. But there seems to be little awareness of indigenous species.

If you ask people about the trees they would like to have in their gardens, they will either say flowering trees or evergreen trees. We need to factor in Delhi's climate where you have a monsoon that normally ends in September and then no rain till July the next year.

Four or five months after the monsoon, trees begin to drop their leaves as a way of adapting to drought. That act, of dropping leaves and becoming dormant, is what characterises a dry, deciduous forest everywhere.

The British didn't understand when they were planting trees in Delhi that species must be suited to the ecological conditions of the city. It is almost a requirement that trees be deciduous, that they drop their leaves in the dry season.

The minute you talk about evergreen trees you are talking about trees that don't belong to this ecosystem. You are talking about trees that are thirsty. And thirsty trees in Delhi's ecosystem are unsustainable.

For me, the biggest problem that faces Delhi now and in the future is the scarcity of water. The CPWD carved out the Buddha Jayanti Park from the Ridge. They planted the same species as in the Lodhi Gardens, assuming that since they were growing there, they would grow on the Ridge. Then they realised that their trees were dying. They needed water every day. So they brought a pipeline right up to the Ridge and now they're watering it every day using copious amounts of water.

You grow the wrong kind of trees and then use water in a stupid profligate way.

I mean, lawns are some of the worst things to happen. Sunder Nursery has repeated that silly

mistake of having vast lawns. Lawns are so inappropriate to Delhi's climate and ecology.

What we need is a much better understanding of what is endemic to Delhi. What works for Delhi?

Absolutely. All the work I've been doing in Rajasthan, Madhya Pradesh or Gujarat is about creating a landscape that is totally sustainable. Jodhpur is a desert, right? We don't water anything. We don't give any nutrients to any plant. If we see a plant dying, we say, "Look, you're the wrong plant in the wrong place and you need to be replaced with a plant that will survive here without any aid." And that is the way to treat large landscapes like the Ridge, not to take a pipeline all the way there and plant the wrong kinds of species.

How can it happen here?

Just by ideas spreading, really. I think the work that the Aravali Biodiversity Park does in Gurgaon is a huge catalyst. On the other hand, to my horror, I saw a pit, a water sprinkler, exotic orchids and ferns growing in Professor Babu's biodiversity park in Vasant Kunj. And this place is touted as being all about natural flora. Is he ashamed of our native flora? That attitude has to change.

The ecological work we have done in Rajasthan, Gujarat and Madhya Pradesh are, in a way, models. People come away, saying, "We never knew that you could actually achieve this." This will spread. There are four or five people doing similar work in rainforests, dry areas of Tamil Nadu, in Auroville, and in the Northeast. It is a small movement but hopefully it will spread.

Continued on page 8

Continued from page 7

What about Delhi's government agencies?

I once did a presentation at the request of Hardeep Puri. The CPWD was there, so was the NDMC, the Cantonment board and the DDA. They all wanted solutions. They said: "We have these *kachnar* trees, what do we do with them?"

I made three or four proposals. I told them, set up a large nursery for native plants in Delhi that all of you can dip your beaks into. Nothing happened.

The Urban Arts Commission did ask me if I had any suggestions for Delhi's gardens. I had one. You need to budget for open spaces, I told them. Otherwise they will all disappear if you go on planting more and more trees every year. They said it's a good idea but nothing has happened.

So you need a movement to promote indigenous trees?

After *Trees of Delhi*, my next book was about trees that belonged to the dry, deciduous forests of central India. One of the most telling statistics is how many native species we have in this country.

According to one of the Kew Institutes, it's roughly 2,400. Now compare this with the UK which has 37. England has 11. The whole of Europe has anything between 1,200 and 1,500. The US has

'India has roughly 2,400 native species of trees. But in our parks and gardens we use 60 to 70 trees out of the 2,400.'

1,000. Germany has 50. China and Indonesia are ahead of us, so is the Amazon rainforest. Lots of Middle American countries have more than us.

But India has an incredible wealth of trees. Do you know how many we actually use in our parks and gardens? It's something in the range of 60 to 70 trees out of 2,400.

That is a terrible statement about us as a civilisation and the extent to which we are curious or even just open about working with our own flora and fauna.

One of the reasons I did that book was because I wanted more people to start planting trees that they hadn't heard of. There are at least 20 species in there that are obvious candidates for horticulture, in gardens or in parks. They have never been tried, only because people haven't been curious.

Nurseries everywhere stock the same thing and then say there's no demand so what is the point in keeping other species? So when people go to nurseries asking for native species they are told that they don't keep them because of the lack of demand.

People don't plant them because they can't get them and nurseries don't raise them because people don't ask for them. It's a vicious cycle. In the last year and a half there are people who have started modest attempts to grow native plants and at least five to six other people are beginning to mull the idea that if they get a nice plot of land, they'll plant native species. So I think the moment has come. ■

A HOME AND INNER PEACE FOR THOSE ON THE STREET

Subir Roy
Kolkata

A young man in his mid-thirties stood in the middle of a busy street in Kolkata's down-market Beniapukur suburb, unmindful of the danger he was posing to himself and the way he was throwing the traffic into chaos. His hands trembled as he muttered to himself and looked aggressively around him. His scraggy hair and beard and ragged clothes indicated he was not fully in his senses.

He eventually ended up with Iswar Sankalpa and was diagnosed with schizophrenia, consuming an enormous amount of alcohol and not taking his medicines regularly. His family, once located, said they wanted to have nothing to do with him. To substitute the missing family support, Iswar Sankalpa found a local *istiriwala* or *presswala* who agreed to become a caregiver and supervise the young man's medication.

In a couple of years the young man started visiting the daycare centre of Iswar Sankalpa. As he grew better he was offered a job by a local *mithaiwala*. Today he pays for his own keep and medicines, takes them regularly, has stopped drinking and has got a new lease of life, literally. Community care and Iswar Sankalpa made it possible for him to recover right where he belonged, without having to check into a hospital or rehabilitation centre.

Iswar Sankalpa was started in Kolkata in 2007 as a non-profit by Sarbani Das Roy, 54, an Ashoka Fellow, along with a few others to work for homeless people with psychological disabilities on the streets of Kolkata. Ashoka is a global organisation that supports leading social entrepreneurs who are chosen after a rigorous process and designated for life as Ashoka Fellows.

When a poor person loses whatever home she has and ends up on the streets, there is half a chance that she will be suffering from some form of mental disorder. To address this Iswar Sankalpa began something unique, Naya Daur, which has remained its flagship programme. Doctors, counsellors and social workers reach out to this homeless vulnerable group to provide care and treatment on the streets of Kolkata itself. It is powered by volunteers from the community who assume the role of proxy family, administering food and medicines. It aims to eventually find for them some kind of a job and,

what is all-important, in the process restore the human contact that had been lost.

One key way in which the unfortunate land up at the doors of Iswar Sankalpa is through its Arogya initiative. Under this its emergency response unit, working with Kolkata Police, is handed over homeless people with psychosocial disabilities rescued by the police from the streets.

Most likely the unfortunate person will find herself at the doors of one of the organisation's day care centres. At these therapeutic centres a distressed person with mental disability finds a haven from the merciless streets. One of the two centres is located within the city's Hastings police station. This combines caregiving with the law as the police are the legal guardians of the homeless with psychological disability. It sensitises the police to the reality that a person with psychosocial disability needs care and is treatable, and does not pose a threat to society.

There is another day care centre in the Keoratala area of the city. Located in a small community space, you have to get to it by walking down an alleyway. This symbolises the link between caregiving and the community.

A key initiative is the Urban Mental Health Programme run in partnership with the Kolkata Municipal Corporation (KMC). Under it Iswar Sankalpa works with five ward health units of the KMC which are urban primary health centres. There the ailing get both care and medicines.

Those who need a place to live to stay away from street abuse and get care round the clock for treatment of acute schizophrenia come to one of two recovery and rehabilitation shelters. The bigger one is Sarbari, for women, in which at any given time there are 80-90 residents, not inmates, Das Roy corrects me. The one for men, Marudyan, houses 30 at any given time. The difference in capacity is significant and reflects a social reality. In India the chances of a poor woman becoming homeless and psychologically distressed are much higher.

Sarbari, made available to Iswar Sankalpa by the Kolkata Municipal Corporation, is unique in its own way. The women, from the poorest section of society, all look well taken care of but are in varying stages of mental health, with some articulate and focused, others not so. I am introduced to one of them with a bright smile who is deaf and mute.

The heart of Sarbari is a large hall which is the living space for the women through the day and in



Sarbani Das Roy



The women are taught a skill so that they can go out and earn a living

the late afternoon turns into a space for group therapy with dance and music. The sound system plays a beautiful Tagore song from the dance drama *Sapmochan*. A few of the women move to it as would those in any dance class while the rest look on.

The women all seem free to move about, except on the first floor, which has the sleeping quarters. A room there is locked, with a glass pane on the door to keep an eye on those inside. Das Roy explains that the sleeping area is usually locked during the day so that the women do not sleep at odd hours but move around and keep themselves occupied as they like. This ensures proper sleep at night.

The freedom with which the women move about results from the fact that a modicum of consent is needed from a person who is brought to stay there. When a person turns restless or violent the police are asked to take her away to a hospital.

A key part of the recovery process is that at some stage the women are encouraged to learn a skill and thereafter go out and earn a living. In a year one or two will go out and not return and this seems to have been budgeted for.

The entire cycle which a woman in Sarbari goes through is there in the story of one in her mid-thirties who was brought in a few years ago by a social worker as she was found wandering near Kidderpore bridge, jabbering to herself with her personal hygiene severely compromised.

For the first few months she didn't interact with anyone. Then she came out with her story of years of tremendous physical abuse by her husband which forced her to leave her child and home. It was after several years on the streets of the city that she was brought to Sarbari.

Then one day she said she liked to cook and

The idea of spending some time at Sarbari or Marudyan is to be able to go back into society. A key goal is reintegration.

missed cooking for her family. This took her to the shelter kitchen and animatedly spending her time there speeded up her recovery. She moved to the shelter's bakery after she revealed during a supported decision-making session that she could try her hand there. But that did not work out so now she is back at the kitchen, working as a 'shelter general duty assistant' and earning her keep and talking a lot!

The idea of spending some time at Sarbari or Marudyan is to one day be able to go back to society with the ability to look after oneself and earn one's keep. Hence reintegration is a key goal and the vocational training unit plays a major part in it. And this is translating into revenue for the unit — ₹3.4 lakh in 2017-18.

The women get trained in skills like stitching, sewing and cooking. They also learn decoupage (decorating an object by gluing coloured paper cutouts and adding special paint effects) and artwork in general. After training they join the production unit that makes bags, accessories and home decorations for sale at exhibitions.

A key skilling facility at Sarbari is the bakery. The

skills imbibed there have now been taken to market. Last year Iswar Sankalpa opened a café, Crust and Core, where the recovering women serve confectionery made by them. In all 10 women have been trained in culinary as well as soft skills, and before opening there were mock runs and visits to well-known city cafes for orientation. The café also displays and sells craft work by the women.

The pot of gold at the end of the rainbow is 'restoration'. As residents regain their cognitive skills, they begin to remember their names and are often able to indicate where their homes were. Once, with the help of the police, a person's home can be located, the journey back is undertaken. Till now 350 one-time residents have returned to their homes. But as many as 30 to 40 percent remain as they do not have adequate recall or their families will not have them back.

Iswar Sankalpa has so far touched 2,800 lives. Out of this 1,800 are treated on the streets through the outreach programme. Beyond this it has offered care to 3,500 people living in slums.

In 2017-18, Iswar Sankalpa had a staff strength of 65 made up of caregivers and others. There are also 80-odd voluntary caregivers. It spent around ₹1.5 crore and has a corpus of around ₹40 lakh. The budget puts it ahead of many smaller non-profits. Among its partners is the Azim Premji Philanthropic Initiatives, Tractors India, the Hope Foundation and the social welfare department of the West Bengal government. Nevertheless, to Das Roy, getting more funding is the foremost concern. For that, society's attitude to mental ill-health needs to change. Even well-meaning neighbours unthinkingly refer to Sarbari and Marudyan as "pagalar ghar" and Das Roy as "pagalar didi". ■

PICTURES BY ANKIT DATTA

A million trees for Guruji

Raj Machhan
Chandigarh

The air is our teacher
Water is our father
The great earth, our mother
— Guru Nanak Dev

TO commemorate the 550th birth anniversary of Guru Nanak, Sikhs in Punjab are taking part in an initiative to plant a million trees across the globe. Guru Nanak Dev, the founder of the Sikh religion, was a strong votary of living in perfect harmony with nature.

The initiative is being led by EcoSikh, an environmental organisation based in Washington, DC. In India, the tree plantation drive is led by Ravneet Singh, an irrigation consultant based in the US who left his job to head the EcoSikh project in India.

“The Million Trees Drive was initiated by our president, Rajwant Singh. We have been celebrating Gurburab in the past with traditions like distribution of sweets, bursting of crackers, *nagar kirtans* and prayer *darbars*. This time we decided to do something that will have a more lasting impact on our ecology,” says Ravneet.

The project’s objective is to plant a minimum of 550 trees in each micro-forest site. It will need 1,820 sites to achieve its target of planting a million trees. “Instead of birthday candles we are planting 550 trees at each spot to celebrate the birthday of our Guru. Our slogan is: 550 *Guru de naam*,” says Ravneet.

The afforestation drive is being carried out with guidance from Afforestt, a for-profit venture that grows micro-forests in a short span using the technique of famed Japanese botanist Dr Akira Miyawaki.

“In February 2019 we came to know of the Miyawaki method of afforestation. We found it very effective since it enabled us to plant 550 trees on just 60 square metres. That was a real breakthrough because it meant we could create small, dense jungles at a cost of ₹50,000 to ₹1 lakh each,” says Ravneet.

Subsequently, to encourage people’s participation, EcoSikh launched a campaign called *Guru ka Jungle*. They appealed to villages, companies, non-profits, various institutions and the government to come forward and help them achieve their goal. Ravneet says that they have received tremendous response from all quarters. “From March till date we have planted 28 forests and we have queries for 350 more,” he says.

The forests, called Guru Nanak Sacred Forests,



EcoSikh’s dedicated group of volunteers

have been planted in Bathinda, Gurdaspur, Chandigarh and other parts of Punjab.

Ravneet is upbeat about the Miyawaki method. He says it is inherently superior. While traditional methods have a failure rate of 95 percent, the Miyawaki technique has a success rate of 99 percent. Forests that emerge are small, dense and bio-diverse. The trees chosen for plantation are all native species. Ravneet says that the Miyawaki forest grows 10 times faster and is 30 times more dense. “With this technique, we are able to condense

The objective is to plant a minimum of 550 trees in each micro-forest site. EcoSikh will need 1,820 sites to achieve its target of planting a million trees.

the 200 years taken to grow a full-fledged jungle into a span of 20 years,” he explains.

The concept of *Guru ka Jungle* has appealed to people across the state. “We have the blessings of our Guru. The fact that we are carrying out this drive to commemorate the 550th birth anniversary of Guru Nanak has appealed to people across all sections and religions. All of us cannot shift to Canada. People are realising that nature is receding, giving way to modern living, and we need to make our environment better. At EcoSikh we are not just religious people, we see ourselves as nature’s people,” he says.

In his experience, people are ready to invest in a greener environment provided they are offered a solution that is credible. The success of the Miyawaki technique has elicited a favourable

response from people across religions and communities.

What exactly is the Miyawaki technique? The Miyawaki jungle has four layers of plants. Each is planted at a distance of just two feet compared to the 30 to 50 feet gap in the traditional method. It is bio-diverse.

The traditional method has 900 to 1,000 trees per acre, whereas in the Miyawaki technique one acre has 10,000 to 12,000 trees. In a monoculture forest you can see through the trees. But if you stand in a Miyawaki forest all you can see is dense greenery all around.

First come the shrubs that grow to a height of eight feet. Next are the subtrees that grow to a height of 20 feet. The third level has trees growing to 35 feet and the fourth level is the canopy, occupied by trees with a height of more than 35 feet.

To encourage biodiversity, EcoSikh is planting 51 different species in every micro-forest. Of these, 25 trees are rare native species such as *lasuda*, *malay ber*, *karonda*, *falsa*, *kareer* and *mahua*. “We can call it a biodiversity conservation project as well. We are creating a seed bank and this will have a long-term impact,” says Ravneet.

The afforestation drive comes at the right time for Punjab. The state has a severe groundwater depletion problem on account of free electricity to farmers. The micro-forests are expected to help attract more rain, increase soil porosity, help in soil conditioning and groundwater recharge, and check soil erosion.

EcoSikh has now started its own nursery at Ludhiana. The project is being sponsored by Gurwinder Singh Sajjan, an industrialist who has donated land to EcoSikh.

“We are really impressed by the response,” says Ravneet. “It is a true example of community resource mobilisation. All we say to people is — if you have the time, do come join us. And we don’t need to say it twice. People contribute freely, inspired by the concept of *sewa*.”

Guru Nanak Dev would surely have been pleased with the offering of a million trees by his followers on his birthday. ■



Himalaya
SINCE 1930

Let’s Break the Myth About Menses.
Period.

Himalaya, in association with the United Sisters Foundation, is conducting menstrual hygiene awareness drives in the rural as well as urban slum pockets of Mumbai. Girls and women aged between 10 and 45 years are educated on **menstrual hygiene management** and **the use of eco-friendly alternatives like reusable cloth pads.**

Dirty drain's waste water is recycled with low-cost tech

Rwit Ghosh
New Delhi

SEWAGE and factory effluents flowing into the Yamuna through a drain in east Delhi are being innovatively recycled so as to protect the river and prevent contamination of groundwater.

In the first intervention of its kind, the DJB is using a technological process provided by a startup, Alcantarilla Limpiar Equipo. The initiative is still at a pilot stage on the banks of the Yamuna near Akshardham.

The effluents are being cleaned to the extent that they can be reused and in the future, even made safe to drink. At the very least, the treated water will cause no pollution if it were to flow into the river or go into the ground.

The Shahdara Link Drain, as it has come to be known, begins its four-km journey to the Yamuna from the railway tracks near NH-24. It winds its way past unauthorised colonies which dump their sewage via a single stormwater drain into it. Although these colonies were regularised and sewer lines were laid, many households do not use the sewers. Additionally, effluents and muck pour in from small factories and illegal slaughterhouses.

Ankit Srivastava, DJB's technical adviser, explains the purpose is to protect the Yamuna from the onslaught of waste from urban areas. There is also concern that groundwater quality is rapidly deteriorating. Many colonies in east Delhi depend on groundwater. The DJB also supplies water it draws from Ranney wells close to the Yamuna.

Mayur Vihar, a middle-class residential colony located here, is facing a water crisis. "In the last three or four years water quality has really declined here," remarks Srivastava. "The Totally Dissolved Solids (TDS) in Mayur Vihar's water is about 1,200. The figure rises the closer you get to the Delhi border with Uttar Pradesh. It is 2,200 in Vasundhara Enclave and increases to 3,000 to 3,500 on crossing the border."

The reason, he explains, is rampant exploitation of groundwater. "When people are not paying for groundwater, they use as much as they can extract," he says. The culprits are mostly recently regularised colonies, residential apartment blocks and illegal industrial factories and workshops.

As groundwater levels decline people get desperate and dig deeper. But levels of TDS, which comprises particulate matter and contaminants like heavy metals, increase the deeper a bore well goes, since fresh water is usually found at the top and saline water at the bottom.

RECHARGING FLOODPLAINS: The DJB is keen to decentralise sewage treatment and raise groundwater levels. Its first successful attempt at Rajokri on the Delhi-Gurugram border, cleaned up a sewage-laden pond by constructing a wetland and used minimal technology.

The Akshardham project, on the other hand, is technologically driven. Alcantarilla Limpiar Equipo, the startup partnering DJB, was founded in 2017 by three cousins, Sidhant Gupta, Sidham Gupta and Bhaskar Mahajan.

"We have been noting the quality of water degrading over the years and realised this would be a constant issue going forward," says Sidhant.



Water before (left) and after treatment



The electrocoagulation unit occupies just nine square metres

The startup aims to clean drains, rivers and lakes. Their machine uses electrical coagulation to process sewage water. The pilot is being done free of cost.

The startup aims to clean up drains, rivers and lakes. It took them two years to develop the machine that they are operating at the DJB facility at Akshardham. They are doing the pilot free of cost.

The machine uses electrical coagulation to process sewage water. Electrical coagulation removes particulate matter like heavy metals, suspended solids and hydrocarbons.

The pilot is being done at one of DJB's Ranney wells in Akshardham. Contaminated effluents are being drawn from the Shahdara Link Drain, cleaned and currently used only for horticulture.

When the pilot stage is successfully completed, the cleansed effluents will be put into the Ranney well which is 60 feet deep and has radial pipelines to draw groundwater.

Without treatment, the drain's toxic effluents are contaminating groundwater on which east Delhi housing societies depend and the Ranney well draws for supplying water to south Delhi.

The Ranney well currently pumps 4.5 million litres a day (MLD) to the Okhla sewage treatment plant (STP) from where water gets supplied to south Delhi.



A close-up of the machine



Ankit Srivastava



Sidhant Gupta

The DJB's idea is to instal multiple treatment plants close to Ranney wells and then use the water according to the needs of the area. "We could either augment the water supply or recharge groundwater tables," explains Srivastava. There are 14 Ranney wells, some of them built 40-45 years ago, located 1.5 km from each other.

The pilot project can clean 10,000 litres of water per day. Currently, the Biological Oxygen Demand (BOD) of the water in the Shahdara Link Drain is 150. It falls to less than 10 after treatment. BOD is a measure of contamination in the water.

Interestingly, it takes the machine only 15 to 30 minutes to clean up the water to this level. Current technology being used in India requires two to three days of retention time before further treatment and filtration.

The best part is that it is low-cost. The investment in technology to clean 10 kilolitres per day (KLD) is just ₹15 to 20 lakh depending on the filters installed.

THE PROCESS: Water is pumped from the drain into the key component of the system — the electrocoagulation unit. It is here that 80 to 90 percent of chemicals and pollutants are filtered out. The machine uses iron plates through which electricity is passed.

The water flows through the iron plates and through a chemical reaction clumps of pollutants form a foam-like substance.

The water is then mixed with polymer coagulants and undergoes a process called flocculation which causes the remaining fine pollutants to clump together thereby making them heavier. The remaining pollutants settle in the next chamber where the water is slowly drained for further treatment.

In the final part of the process the water passes through two filters, a multi-grade filter which cleans up any remaining particulate matter and an activated carbon filter. "The filters can be changed or more can be added and modified to get the water level to an even lower BOD," says Sidhant.

The plan is to lower the BOD from 10 to just two. "Essentially, we are aiming for drinking water quality," says Sidhant.

The machine occupies just nine square metres of space. But the best part is its low-cost. The investment in technology to clean 10 kilolitres per day (KLD) is just ₹15 to 20 lakh depending on the filters installed. "Barring its operational and maintenance costs, of course," says Sidhant, laughing.

WETLAND TO TECH: Why did the DJB switch from constructing wetlands to a tech solution? Srivastava explains that one solution doesn't work for all water bodies. Rajokri's topography is different and the area is rural. The place requires the people to participate in maintenance.

"Rural set-ups generally need to be low-maintenance and have a robust system. They don't need skilled manpower," says Srivastava. "In contrast, the Akshardham pilot is an emergency solution to a critical water issue."

"The idea is to have wastewater recycling systems, which use the recycled water, replace the demand for potable water and, wherever possible, augment the water supply," says Srivastava. "Setting up decentralised water treatment systems at source is key."

The DJB is also considering sucking out all the water from the Shahdara drain, treating it and then releasing it back into the drain further downstream, allowing it to percolate and disgorge into the Yamuna.

The outcomes of the pilot will be positive. "It will reduce the flow of sewage going into this drain which, in turn, will ensure less pollutants in the Yamuna. It will also severely reduce the pollutants going into groundwater tables," says Srivastava. ■

Samita's World

by SAMITA RATHOR



'ME TOO' HELP FOR DOMESTIC WORKERS

Sidika Sehgal
New Delhi

IN November 2016, when the Martha Farrell Foundation (MFF), a non-profit, began working with domestic workers in Delhi and Gurugram to address sexual harassment, they found the women reluctant to speak about their experiences. It was only after building trust that they began to talk. The breaking point came in 2018 when the women told MFF activists that a 17-year-old girl in Gurugram had committed suicide because her employer had sexually abused her.

Most domestic workers are the only earning members of their family. Losing an income is not an option. Since they are migrants in a city far from home, they feel even more vulnerable. Thus they either see sexual harassment as a routine work hazard or they ignore it. Taking action is almost never an option.

But the Sexual Harassment of Women at Workplace Act, 2013, mandates that a Local Committee (LC) in every district should be set up to which domestic workers can complain. The Act recognises the right of domestic workers to a safe

Sexual harassment should be a labour issue and not just a gender one. Domestic workers don't come under labour laws.

workplace, and homes as a workplace for domestic workers. The Local Committee is meant to be under the jurisdiction of the district magistrate (DM) or district collector (DC).

Through RTI enquiries filed between September 2016 and March 2017, MFF found official data on Local Committees. Out of 655 districts in India, only 29 percent replied that they had formed a Local Committee. There was no functioning Local Committee in Delhi at that time. Two existed but only in name.

When MFF presented the data in September 2018 to Delhi's deputy chief minister, Manish Sisodia, he instructed all DMs to form Local Committees by November 2018.

Earlier in June 2018 when MFF activists did a rapid survey with 291 domestic workers in Gurugram and Delhi, they found that they did not know anything about Local Committees.

Even if they did, it would have taken them time to reach the Local Committee's office and that meant missing work. Nandita Pradhan Bhatt, director of operations at MFF, says, "It is the Local Committee's job to go looking for women, not for the women to spend a lot of money to come looking for the Local Committee. Every last mile, each woman must be



Nandita Pradhan Bhatt



Drawings by domestic workers describe the harassment they face

aware of the issue and that she can complain and where."

Bhatt is a member of southeast Delhi's Local Committee and she has been able to bring about some change. The district officer of the Department of Women and Child Development (DWCD) is also a member of the Local Committee. She mentioned that she has a cadre of anganwadi workers and supervisors under her. She suggested that this workforce could be harnessed to reach domestic workers.

"Anganwadi workers who look after the children of domestic workers, share a rapport. As peers, they can strike up conversations about sexual harassment and tell them about the redressal mechanism available for them," says Bhatt.

Bharti Sharma was chairperson of the Local

Committee in southeast Delhi district when this model was adopted. She said that they were conscious about not increasing the burden of the anganwadi worker. "There is a lot that can be done through conversation," she remarked.

The role of the anganwadi worker is to encourage the domestic worker to report and to facilitate writing the complaint if required. In the pilot model developed by MFF, the anganwadi worker passes on the written complaint to the Child Development Project Officer (CDPO), who sends it to the

district officer of the DWCD. This postal chain allows the domestic worker to file a complaint without missing work.

MFF held a training session for the CDPOs and supervisors and a training session for the anganwadi workers of southeast Delhi district. Bhatt, who conducted the training session, told them about the Act, their responsibilities and what the Local Committee is. The officers felt that an awareness campaign was not difficult to implement.

Sharma's tenure as chairperson ended in July 2019. Between November 2018 and July 2019, the Local Committee examined seven to eight complaints. During the inquiry, both the complainant and the accused testify, present documents for evidence and furnish witnesses, if

any. The Local Committee submits its final report to the DM who adjudicates. The Local Committee is only a recommending body. It has no power to initiate criminal proceedings. It is up to the DM to forward the complaint to the police.

Only one complainant was from the unorganised sector. The rest were women who worked in the organised sector. They were either dissatisfied with the decision of the ICC (Internal Complaints Committee) or worked in a company that didn't have an ICC. Sharma was disappointed that they hadn't impacted the unorganised sector.

Sharma says that domestic workers need to be empowered and encouraged to complain. "There is still a long way to go. Let's try this model out. It might fail. But unless you try, how are you going to find out?" One training session is obviously not enough.

The 2013 Act sanctions no budget for the Local Committee. In southeast Delhi district, getting a room to sit in and a cupboard to store documents was a challenge. Bhatt explained that MFF could have held the meeting on their premises, but a constitutionally mandated body like the Local Committee is the government's responsibility.

Sharma also suggested that putting up posters about sexual harassment outside anganwadis could help. They would help spark a conversation. But the lack of a budget stood in the way of implementation. Neither the DM nor the DWCD have a budget for this.

District magistrates are not always aware of their responsibility towards the Local Committee. There is also no continuity. In southeast Delhi, the DM has changed every two months. "We shouldn't have to ask the DM to be cooperative. It should be a given," Sharma asserts.

Employers, on the other hand, are aware of the rights of their domestic workers. After all, many employers work in the organised sector and understand the concept of workplace sexual harassment. "We are very bad employers. We do not take care of those who work for us," Sharma says.

Both Bhatt and Sharma argue that sexual harassment should be a labour issue, not only a gender one. Domestic workers are not included in any labour laws. Their work is not recognised as labour, even though it allows people in the organised sector to work. Also, the sexual harassment law needs to be made gender neutral and include LGBTQIA and men.

During Sharma's tenure, the six-member committee comprised two men and four women. This was a conscious decision because she believes that both the complainant and the accused should feel comfortable when they tell their story. The feeling is that if there is no man on the committee, men won't get a fair trial.

According to Bhatt, the next step is to share their research with organisations that are working with domestic workers. A meeting of all Local Committees in Delhi to discuss what they have learnt and the challenges they have faced is also on the agenda. ■



Schoolchildren poring over a map of the east Kolkata wetlands

Taking wetlands to Kolkata's children

Subir Roy
Kolkata

THE east Kolkata wetlands, a unique resource described as the city's kidneys that clean up wastewater and help grow fish and vegetables, are threatened. The changing nature of waste which is getting more and more inorganic, and urban greed for land are the twin dangers.

To fight this, those who live amidst the wetlands have to realise what they need to preserve and the best way to create public awareness is to speak to the young. Climate Diplomacy Week 2019, organised by a group of artists, Disappearing Dialogues Collective, and the German consulate in the city, reached out to the children of two schools in the area, Kheadaha High School and Bamanghata High School.

The children participated in workshops where they learnt how to recycle discarded items of everyday use like plastic bottles, caps, jars and tyres. What they created became part of an exhibition curated by Nobina Gupta and put together by the collective.

The exhibition began with the history of how the wetlands evolved and interpreted the ecological story of recycling. It noted the contribution of Dr Dhrubajyoti Ghosh, an ecologist credited with discovering and documenting the resource recovery features of the wetlands.

It also noted the ecological loss from human interventions in the city and pointed to an uncertain future. An imaginary digital artwork with the cityscape made out of dumped waste showed how waste of all kinds produced in the city comes to the wetlands, upsetting its ecological balance, and the benefits of protecting the environment.

A map with nearby landmarks showed the wetlands and the participating communities in the proximity of the city. The unstated demons are the newer concrete structures which are still being permitted.

Art workshops were held to create environmental awareness and the need for conservation among the youth. Alternatives were evolved on how the gap between pedagogy and innovation can be breached. Teaching aids were made like *patachitra*, a song on the story of the wetlands, a booklet and a visual calendar.

The youth travelled along the wastewater canals in the wetlands to collect samples, record their observations through sketches, drawings and writings. A nature journal was created from observations of children, stories by children and local recipes.

An arresting feature was a video presentation as a walkthrough on the role and importance of canals. A big fishing net on a bamboo structure reflected the unique fishing practices utilising wastewater as a nutrient.

A series of workshops was held with the schoolchildren on how to deal with waste by making handmade paper from banana stems, herbal gardens in discarded plastic bottles, and musical instruments from domestic waste materials.

There was an actual boat with a pool of waste depicting the link between water, wetlands and the urgency of the situation. The exhibition was marked by aesthetic appeal and innovation that showed how the ordinary things we do and the stuff we throw away cost us so much. ■

A festival to teach children croc love

Tanushree Gangopadhyay
Ahmedabad

THE first Children's Crocodile Fair was held in Malataj village, in the lush Charotar region 20 km from Anand, India's milk capital. As many as 135 children between 11 and 15 years old took part.

The theme of the fest was 'My village, my crocodiles.' The day was full of games and competitions specially designed for children.

The fest was organised by the Voluntary Nature Conservancy (VNC), locally called the Vidyannagar Nature Club.

"Children are never involved in crocodile fests. We believe in educating them to live harmoniously with wildlife including crocodiles. Children are the custodians of the habitats of reptiles," explained Dhaval Patel, managing trustee.

About 150 to 200 crocodiles live in the Charotar belt in the twin districts of Kheda and Anand.

The children played two games — Crocs and Ladders, and Crocs, Where are Your Eggs?

There was also a painting competition and an elocution contest. "Drawing crocodiles who live in our village pond was really very invigorating," said young Bhumika Parmar. Her creativity and skills won her the first prize.

All the paintings were very colourful and vibrant and reflected the affection the children had for the crocodiles in their village. Viji Ode, Dhavan Macwana, Pallavi Patel and several other children who took part in the elocution contest won awards. "Crocs have 24 teeth. They are our friends and can never be our enemies. We have 17 crocs in the two



The Crocodile Fair was organised by Vidyannagar Nature Club

ponds in our village and we would not like them to move out," said Prakash and Deep from Petli village.

Prakash said he loved playing *eendu* or the egg game. The child has to cross a stretch without harming a female crocodile played by another child, protecting her eggs. The child who crosses successfully is a winner. White stones from the river beds were kept along the path representing the eggs. No live crocodiles were brought in. This game has been replicated from the traditional game of *eendu*.

Most of the children who participated belonged to poor homes, many of whom couldn't afford to purchase school bags and geometry boxes. A school teacher from Traaj village narrated Alpesh Kumar's case. The boy had sought financial assistance to buy a school bag. Luck favoured him. He won the third

prize in the painting competition and received a school bag along with a cash prize of Rs 500. All the children who won were given school bags. The Vidyannagar Nature Club gave all the children who participated Camlin geometry boxes with a poster of 'My village, my crocodiles' pasted inside each box.

Crocodile festivals are an annual affair in several Western countries. "We plan to make it an annual affair in Charotar. It will be rotated, so as to involve every village," said Patel.

The crocodile festival was a local affair which reached out to the local community. Teachers and the revered Dr Raju Vyas, Regional Vice Chairman of IUCN/SSC Crocodile Specialist Group, South Asia and Iran, attended. He is also the retired inspector of the Sayaji Baug Zoo in Vadodara. ■

Delhi to Geneva, a march for peace

Bharat Dogra
New Delhi

SHRADHA works as an activist of Ekta Parishad in the interior villages of Madhya Pradesh. She has a lot of community work on her hands, apart from family responsibilities. But recently she decided to put her work on the backburner for the rather long period of a year.

The reason is that she decided to join the Jai Jagat Global Peace March. This Peace March started on October 2 from Rajghat, Delhi, and will end in Geneva next year on September 26, which is World Peace Day.

Benjamin Chapple is a child welfare advocate based in Australia. His work is very important to him but, like Shradha, he too decided to join the Jai Jagat Peace March for a year.

Like Chapple and Shradha there are 50 men and women, including many young people, who have started the march which will take them to 10 countries to spread a message of peace and justice with a Gandhian perspective. From October to January the march is in India. Then it will be followed by a march for peace in several other countries including Iran, Armenia, Georgia,

Romania, Bulgaria, Italy and Switzerland. Apart from the main march there will be supporting marches, meetings and efforts in other countries and regions, leading to the involvement of a much larger number of people.

While many organisations have been involved in this effort the overall coordination is by P.V. Rajagopal who heads the Ekta Parishad, an umbrella body of several grassroots organisations involved in land and justice struggles, particularly struggles of landless people and tribal communities. The Ekta Parishad has close relations with other organisations involved in land struggles in various parts of the world. In fact, representatives of such organisations from nearly a dozen countries, ranging from Cambodia to Ecuador, Nepal to Kenya were present at the Delhi events to inaugurate and flag off this march.

Michael Taylor is director of the International Land Coalition. Speaking on behalf of several organisations engaged in struggles to defend or demand land rights, he said that this was an important moment for land struggles, coming together to support a major initiative for peace and justice.

Chapple said that while only "a few of us" had

been able to keep aside other responsibilities of family and work to join this important initiative for a year, there are so many others who believe fully in the objectives of the march and it should strengthen the voice of these people.

This march, also briefly called Jai Jagat 2020, is taking place at a time when the 150th birth anniversary of Mahatma Gandhi is being celebrated and there is a lot of interest worldwide in understanding the message of the Mahatma in the context of serious present-day survival problems such as climate change and weapons of mass destruction. The march can be an opportune occasion to look for solutions to these major, life-threatening problems from a Gandhian perspective.

Jill Carr-Harris, the marcher who has played perhaps the most important role in the detailed planning of the initiative, said that such important concerns will definitely be on the minds of the marchers and their supporters.

Rajagopal asserted that this march also provides an opportunity for many diverse movements with a shared commitment to peace, justice and environment protection to draw closer together, bolstering the efforts of all. ■

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A MILLION WELLS FOR BENGALURU

Recharging aquifers is going professional across the south

Shree Padre
Bengaluru

RAINBOW Drive, a housing colony on Sarjapur Road, has never known a water shortage. It is a big thing in Bengaluru where tankers routinely make up the deficit in municipal supply and predictions have it that the city's groundwater will all but vanish in a few years from now.

Not so at Rainbow Drive where its residents in 280 homes don't live with such daunting fears. They are secure in the thought that they will always have enough — thanks to some 250 recharge wells dug in backyards and stormwater drains that soak up almost as much rain as falls on the 35 acres of the colony.

When their homes were first handed over by the builder in 2003, the residents had two bore wells to meet their needs. But bore wells go deep down and tend to fail. The 250 recharge wells they now have work differently by replenishing water in aquifers closer to the surface, making better quality water perennially available.

Rainbow Drive was fortunate to get the advice of Biome Environmental Solutions, a design firm focused on ecology, architecture and water. The firm was formed in 2008 by merging S. Vishwanath's Rainwater Club with Chitra Vishwanath's practice as an architect.

Vishwanath has been a water-harvesting evangelist who in 2018 launched the Million Recharge Wells Campaign to make Bengaluru self-sufficient in water. He believes the solution provided to Rainbow Drive is, in fact, the one best suited to Bengaluru on the whole. Instead of boring deep tubewells, the city should be using open wells and drawing on shallow aquifers. Bengaluru gets enough rain and Vishwanath's calculations are that a million recharge wells will put enough back into the ground for the city to put water shortages behind it.

The setting up of Biome Environmental Solutions is part of a larger trend of mainstreaming traditional practices like water harvesting and offering them as professional services with quantifiable results.

With water scarcities growing consumers need sustainable solutions. As awareness spreads and expertise becomes available, people are realising that there are many uses for water harvesting beyond personal consumption such as diluting industrial effluents and combating fluoride.

There has been an increase in the number of small enterprises to cater to the needs of factories, campuses, farmers and households. Most of these enterprises carry out rooftop water storage, recharge of bore wells and construction of open wells for a fee.

These business activities have also helped revive traditional livelihoods. In and around Bengaluru, thanks to Biome, the Mannu Waddars, a sub-caste of the Bhovi community, have found work because of their knowledge of digging and maintaining wells. Similarly, the *tanka* from Gujarat has found its way to the south.

Rainbow Drive basks in its status as a zero run-off colony. "Out of 100 rainy days, water might overflow from our premises for only eight to 10 days," says K.P. Singh, a resident.

People are finally learning to pay for water and take responsibility. "Our policy is a recharge well for each house. Everyone has to contribute towards water sustainability," explains Singh.

ISABELLA PORRAS-THE WATER STORY



S. Vishwanath: 'In Bengaluru about 10,000 open wells are still in use'

"We haven't spared a single house. Most families have dug the well on their premises. Those with space constraints have paid us ₹30,000 to dig the well outside their houses on their behalf," he says.

There is differential pricing of water, implemented by consensus. Those who consume more, pay more. Monthly consumption is classified into three slabs. Residents who use up to 15 KL (15,000 litres) pay ₹15 per KL. For 15 to 25 KL, the rate is ₹50 per KL. For consumption above 25 KL, charges jump to ₹125 per KL.

BEING SELF-SUFFICIENT: "A million recharge wells will make Bengaluru self-sufficient in water," says Vishwanath. "Each acre in the city is blessed with 3.5 million litres of rainwater. Even if just one-third percolates into the ground, we can manage without Cauvery water," says Vishwanath.

Nobody in India has studied open wells and shallow aquifers as deeply as him. Vishwanath, whose pseudonym is Zen Rainman, has gone globetrotting to Iran, China, Sri Lanka, Indonesia, Brazil, Chile, China, Sweden, Finland, Estonia and Latvia to study wells.

Biome Solutions' calculations are as follows: Greater Bengaluru is spread over 750 sq km. From half this area, 80 percent of rainwater runs off. Bengaluru loses billion of litres of water in this way.

"To catch this huge quantity of rain, we need a million recharge wells. Those with three feet diameter and 20 feet depth are suitable. Each well can hold about 4,000 litres of water," says Vishwanath.

Bengaluru already has 100,000 recharge wells and another 900,000 are needed.

The recharge well was first introduced in Chennai in the 1990s by the Alacrity Foundation. The Rainwater Club popularised it in Bengaluru. "These are suitable for large areas like apartments, colonies and layouts. The Indian Institute of Management (IIM) campus has recorded a percolation rate of 1,000 litres an hour in recharge wells. The overall percolation rate of rain in Bengaluru is, as per



A row of recharge wells at Lalbagh in Bengaluru



Recharge wells dug in a stormwater drain at Rainbow Drive

estimates, three to 10 percent. To increase this to 50 to 60 percent, we need recharge wells," says Vishwanath.

"Wells have a history of 4,500 years," he says. "In Bengaluru, about 10,000 open wells are still in use. In the city's geological landscape, the shallow aquifer is very important. We can easily recharge wells and go on using them. Actually, it's high time we started conserving and utilising our shallow aquifers on priority."

Biome began seeking out Mannu Waddars or the city's traditional well diggers and mapping the city's existing wells. It recently conducted an awareness session for them.

Bengaluru is lucky to still have Mannu Waddars. Altogether 750 families live in and around the city. A three by 20 feet recharge well, dug by a mannua waddar, costs around ₹30,000.

Traditional well diggers collectively have the capacity to dig 1,000 recharge wells per day. "Their deep knowledge of the hydrogeology of the city is contributing into turning our dream into reality," remarks Vishwanath.

"We made the well diggers our ambassadors," says K. Ramprasad, co-founder of Friends of Lakes, who has joined the campaign. "They go house to house requesting work and explaining why it is better to trust the shallow aquifer."

Water harvesting is prompting a rise in small enterprises. New water harvesting companies have come up to cater to the demand for water by factories, campuses, farmers and households.

Slowly, people in power, residents in apartment blocks and house owners began responding. "The recharge well has entered the lexicon of builders and architects," says Shubha Ramachandran, team leader of the Biome Environmental Trust, the non-profit arm of the firm under which the 1000 Wells campaign comes. The Bellandur Development Forum plans to dig 2,500 wells in a low-lying area at the Bellandur Lake that gets inundated with rainwater during the monsoon.

The campaign has also caught the attention of politicians and bureaucrats. The deputy chief minister, C.N. Ashwath Narayan, has initiated digging of 100 recharge wells in his Malleshwaram constituency. So has Ramalinge Gowda, MLA from Koramangala constituency.

Recharge wells can also control urban flooding. "To save lakes we have to increase the groundwater table," says Ramprasad. "Recharge wells are the best choice."

It is also a fallacy that the entire city's groundwater levels have plummeted. "Many areas still have open wells which provide water, yet people dig bore wells," says Venkatesh, a traditional well digger who can rattle off groundwater levels in each area of the city. "In Indiranagar you get water at 10 feet, in JP Nagar at 15 to 20 feet, and at Banashankari Third Stage, BTM Layout and Domlur you strike water at 15 feet."

Adds Ramakrishna, another well digger: "Ulsoor has water at five feet. In and around Marappa Garden, many families still use open wells. At HSR Layout, you get water at 20 feet."

Vishwanath is hoping the Kannada language media does some consistent reportage on the Biome campaign. The local language press, he says, can play a bigger role in spreading the message than seminars in English.

CUBBON PARK: A cluster of recharge wells in Bengaluru's famed Cubbon Park has hugely increased its stock of water. The park's success was noted by half a dozen government institutions, which have decided to follow suit.

Cubbon Park stretches over 197 acres. Around 1.2 million litres per day are required to irrigate its garden. The park has three bore wells, which don't perform. It buys treated water from the Bangalore Water Supply and Sewerage



Yogiraj Kolhar uses this tank lined with a plastic sheet to store water for his grape garden in Tikota in Bijapur



A traditional well digger in Bengaluru



A new well being dug in Chennai where there has been a revival in recent years

A cluster of recharge wells in Bengaluru's famed Cubbon Park has hugely increased its stock of water. The success at the park has inspired half a dozen government institutions to follow suit.

Board (BWSSB) and pays ₹20 per KL or ₹70 to 80 lakh per year.

In 2017, the park's officials, with help from Ramprasad, revived seven open wells which had been lying idle for 50 years. "There was a lot of silt and waste material inside. We cleaned the well and covered it with mesh," says Mahantesh Murgod, the then deputy director of horticulture for Cubbon Park.

This year 60 recharge wells are being dug. "Well revival has reduced water shortage in the park. We now save ₹25 to 30 lakh annually. By next year we should be self-sufficient." Seeing Cubbon Park's success, Lalbagh has set out to dig 100 recharge wells.

The Railway Wheel Factory, a public sector company, has opted for recharge wells. The factory requires 200,000 to 300,000 litres per day for cooling processes. It has five open wells and four bore wells but they were insufficient so about 200,000 litres of treated water used to be bought from BWSSB.

In the past two years, the factory began to seriously enrich its shallow aquifer. Four out of five wells, located at the lowest level of the campus, were cleaned. Old, silted ponds were deepened and new ones dug. All the stormwater was directed to this low-lying area, designated an eco-zone.

Now the run-off from 191 acres goes to the eco-zone and fills all the ponds and wells which have started yielding ample water. All of last year their own water was adequate. This year, due to less rainfall, the factory bought some water for six months. Bore well water has been kept in reserve. This year they have decided to rejuvenate their fifth open well and dig one more.

The factory has also started harvesting roof and surface water in a big way. "From next year we might not need to pump water from our wells during the monsoon," says Ajay Singh, chief environmental officer of the factory. The Border Security Force (BSF) and Central Reserve Police Force (CRPF) have now sought the Railway Wheel Factory's expertise to augment their water resources.

CHENNAI'S WELL REVIVAL: After a gap of 25 years, interest in recharge wells is being rekindled in Chennai. "Three decades ago, Chennai's city area was 174 sq. km. At that time, each house had a well. Now our city has expanded to 426 sq. km. After the apartment culture caught on, open wells disappeared," says Dr Sekhar Raghavan, director of Rain Centre in Chennai and an expert in rainwater harvesting.

In 2003, the Jayalalitha government made rainwater harvesting mandatory for all buildings in Tamil Nadu. In a survey conducted a couple of years later, Rain Centre discovered that in parts of the city the water table had risen by six to eight metres.

In 2007, AB Apartments in Bhaktavatsalam Nagar found that their bore well had become dry. They sought Dr Raghavan's advice and invited him to their apartment block. He was surprised to find their open well had water but nobody was using it. He drew a bucketful and found that the water tasted fine. After a little persuasion, residents started using it.

The Rain Centre has been advising people to dig open wells. In some areas where bore wells had gone dry people discovered they could strike ample groundwater thanks to the water-rich shallow aquifer. About 50 newly dug wells, initiated by Rain Centre, are all yielding water. The water authorities have now taken to digging big open wells.

"We have to recharge with rain sensibly. People can use well water during the monsoon months and in summer, they can use bore wells. Conjunctive use of shallow aquifers and deeper aquifers will make water use sustainable," says Raghavan.

IMPROVING QUALITY: Although the main objective of rainwater harvesting is to increase water quantity, it also helps to improve quality. Two examples are seen in the work carried out by BAIF Institute for Sustainable Livelihood and Development in Karnataka and the Rainwater Literacy Foundation (RLF) in Erode in Tamil Nadu.

Erode suffers from water scarcity, water contamination and its shallow aquifers have disappeared. Rainfall, on average, is 470 mm annually and very erratic.

K. Shivakumar, a British citizen born and brought up in Erode, founded the RLF, a non-profit, in 2012. Every year he spends three months in his home town, propagating rainwater harvesting and revival of recharge wells, knowledge he gained from his association with Vishwanath.

Shivakumar realised that the fastest way to percolate the maximum water in Erode was through recharge wells. As per World Health Organisation (WHO) standards, water with Total Dissolved Solids (TDS) levels more than 400 is not potable. Cauvery river water has TDS of 4,000 when it crosses the Tamil Nadu border from Karnataka, according to Shivakumar. "Once the river reaches Erode, TDS levels shoot up to 40,000 because industrial effluents are discharged into the river. The water has traces of toxic metals too," he says.

"Groundwater levels have plummeted. Shallow aquifers have vanished in many areas. Where such aquifers can be found their water is so contaminated it's not fit for bathing."

The RLF has alleviated the water shortage in two schools through rainwater harvesting and digging recharge wells. The schools are the Sagar International Senior Secondary School in Perundurai on the outskirts of Erode and the S.V.N. Matriculation Higher Secondary School at Kongapalayam.

ISABELLA PORRAS-THE WATER STORY



A school in Erode gets a water recharge system



BAIF's rainwater storage tank in Tumkur



K. Shivakumar

The RLF has alleviated water shortages in two schools in Erode by harvesting rain and digging recharge wells. Water in Erode's aquifers is very polluted.

On Sagar School's 21-acre campus 40 recharge wells were dug along with two ponds to catch any spillover from the wells at a cost of about ₹6 lakh. The school has two bore wells. In the previous five years it was spending ₹5,000 to 7,000 per day buying water from tankers.

"For the last two years we have had very little rain. Yet we don't have any water shortage," says C. Soundararajan, the school's correspondent. "Water levels in our bore wells have risen from 600 feet to 900 feet. And TDS levels have declined from 1,500 to 1,000."

The S.V.N. Matriculation Higher Secondary School has an open well and four bore wells. They were spending around ₹6 lakh annually buying water. But no

longer after nine inter-connected recharge wells were dug after identifying the rainwater run-off path. Two more have been dug near the bore wells. The school's administrative officer, P. Thangaraj, is hopeful that if rains are good this year, the school will be self-sufficient in water. Both schools have nearly zero run-off now.

The RLF doesn't charge for its services. "In Tamil Nadu, mostly in Erode, we must have dug more than 1,000 recharge wells. To suit local soil conditions, we keep the diameter of the well at three feet by five feet and the depth at 15 feet," he explains. Shivakumar's water mantra is: reuse, recharge and then discharge.

FIGHTING FLUORIDE: The BAIF, on the other hand, has been tackling high levels of fluoride in water — a major issue in 16 states — through rainwater harvesting. In three fluoride-hit districts of Karnataka — Gadag, Tumkur and Chikkaballapur — BAIF has carried out probably the most extensive attempt in India to combat excessive fluoride in water.

It has built about 8,000 roof water storage structures in the three districts. All eligible families are covered in villages like Gamkarnahalli, I.D. Halli and Shanghanahalli in Madhugiri taluk of Tumkur.

Covered tanks of 5,000 litre capacity are constructed, using local masons and local knowledge. "The results were instant. Within three months of drinking this safe rainwater, many residents suffering from joint pain could bid goodbye to painkillers. The number of visits they made to the hospital were reduced and their ability to work improved," recalls Pandit Patil, chief programme executive of BAIF.

The non-profit estimated four litres as the daily drinking water requirement of a person. For a family of five, the stored water lasted eight to 10 months.

"However, instead of providing drinking water alone, if we follow an integrated approach, combining soil and water conservation with groundwater recharge work, the results are even better. The reason is simple. The fluoride content in groundwater gets diluted," says Patil.

Adoption of both techniques, recharge and storage, is the best strategy.

FARM WITH RAIN PONDS: An innovative storage-cum-recharge structure is being promoted by 79-year-old Dr P.K. Thampi, a retired geologist in Thiruvananthapuram. He is the founder of WESTCON (Water Environmental Sciences & Technology Consultants) and previously worked as head of the



WESTCON's rain pond at Kumbanad Bible College in Pathanamthitta

WESTCON, a company founded by P.K. Thampi, a retired geologist, digs storage-cum-recharge structures for institutions facing water shortages. His rain ponds raise water levels.



Dr P.K. Thampi

Geosciences Section of the Centre for Earth Sciences. Most of his projects are in Kerala and he is approached by institutions battling water shortage.

Thampi's method is to capture run-off from a vast area and collect it in a newly dug rain pond. A sub-surface dyke is constructed adjacent to the pond, using a plastic sheet. This is inserted into a deep trench. The dyke checks side seepage of the sub-surface flow.

One of WESTCON's best projects is at the Ahalia Foundation's 35-acre campus in Kozhippara near Palakkad. This is a rain shadow area with annual rainfall of less than 1,000 mm. Before 2002, the campus didn't have enough drinking water.

The first rain pond of 1.5 hectares was constructed that year followed by two smaller ones. The campus now has seven rain ponds on five hectares which together collect 200 million litres. These ponds have helped raise the water table.

In fact, water levels in wells near the ponds have risen to the same level. There is no scarcity even after summer is over. The foundation grows vegetables and paddy with this water. The ponds have changed the micro-climate of the locality. "I don't think any other big rain farm like this one exists in the country," says Dr Thampi.

In the past two decades 40 such rain ponds have been built on Dr Thampi's advice. Some are at Yenepoya Medical College in Mangalore, Kinfra Film and Video Park, Thiruvananthapuram, Kumbanad Bible College in Pathanamthitta district, Textile Park in Palakkad, Food Park in Adoor, Industrial Park in Kunnathanam and others.

The stored water is lifted from a well built inside the pond. "After the second season of rain, you can take out about three times water you see from the pond. This is because the pond recharges a large area where water can't be seen," he says.

THE OPEN RAINWATER TANK: Rainwater storage tanks are also becoming increasingly popular. Unlike Dr Thampi's rain ponds, these are impermeable sheet-lined tanks that store water by stopping seepage.

P.J. Varghese, a farmer from Kottayam district in Kerala, founded P.J. Rainpond India Pvt Ltd to make such tanks 14 years ago. So far, his company has

constructed about 200 big ponds for agriculture, fish farming, industrial and recreation purposes. P.J. Rainpond undertakes the complete work of tank construction.

According to Varghese, a one million-litre tank, including all works, costs around ₹1 per litre. The larger the tank, the lower the per litre cost. He has built tanks that can store as much as 15 million litres. "We can make even bigger ones," he says.

Different types of sheets are used to line such tanks. But a common complaint from farmers is that these sheets don't last long and have to be replaced every four or five years, which is an expense.

Varghese's rain ponds are lined with three different sheets, one above the other. The upper and lower sheets are protective. The middle one is to stop seepage. "We have to take certain precautions. The earthwork has to be carefully done. Anything that can pierce the sheeting has to be manually removed. The sloping has to be correct. The outer edge of the sheet has to be closed so that small creatures don't damage it," he says. Varghese claims that he gives a five-year guarantee on his tanks and attends to all customer complaints.

Today there are many agencies like P.J. Rainpond that build such tanks on contract.

RIVER WATER STORAGE: A new instance of the use of such sheet-lined tanks is by the grape farmers of Bijapur in Karnataka. Bijapur grows the sweetest grapes in India and farming grapes is very remunerative there.

Tikota taluk is a prominent grape belt. But for three months in summer bore wells run dry and farmers face a scarcity of water. Krishna river water is brought to the district by canals due to the initiative of M.B. Patil, former

irrigation minister.

Farmers construct plastic-lined tanks and fill them with the river water to use in summer. "We calculate how much water we require for these three months and then decide tank capacity," says Yogiraj Kolhar, a farmer with a 20-acre grape orchard.

His newly constructed tank, which cost ₹15 lakh, covers an acre and will hold about 40 million litres. "About 10-15 tanks are being constructed this season," he says. River water has an added advantage. It is soft water, and of good quality as compared to hard water from bore wells. These are all open tanks not meant for drinking water but for irrigation.

TANKA UNDER HOME: The *tanka* is an underground tank for storing drinking water traditionally used in Gujarat. Roof water is filtered and then stored in *tankas*. Old two-storied homes in Gujarat still have *tankas*.

Most *tankas* are engineering wonders for two reasons. The *tankas* have to bear the hydraulic pressure of water stored in them plus the weight of the building above. Some of these *tankas* were built before cement was invented.

Several houses in Dwarka city in Gujarat have *tankas*. Even new houses invariably have a *tanka*. Generally, they are so big that the household has enough water to last two years. The family uses this water for drinking and cooking only.

The *tanka* has now spread to Telangana, Maharashtra and even Karnataka. Says Dr Devraj Reddy, a water expert, "In Karnataka, many people have built sumps to store rainwater. But this custom of constructing underground *tankas* alongside house construction was unknown earlier. Now I know of at least two dozen homes in low-rainfall areas of Karnataka where *tankas* have been constructed." These have been built on his advice.

This current phase of water harvesting is marked by invention, enterprise and the spread of knowledge. The new mantra is — catch water where it falls and make some money too, but responsibly.

Biome Environmental Solutions - (080) 4167 2790; water@biome-solutions.com



Chandra Bhushan: 'We will be very engaged in the climate change debate'

'Environment needs tech, innovation'

With iFOREST Chandra Bhushan hopes to break new ground

Civil Society News
New Delhi

IT is not common to find a hard-nosed environmentalist with a fan following in the boardrooms of corporations. Chandra Bhushan is one such.

As the leader of the Green Rating Project at the Centre for Science and Environment (CSE), Bhushan held an unwavering mirror to the standards of industries such as paper, cement, automobiles and mining.

Company after company was persuaded to improve technologies and processes. A space was created for engagement with senior management, which learnt to abandon stealth for a willingness to talk openly about where their factories were falling short.

Bhushan has now set up iFOREST or the International Forum for Environment Sustainability and Technology. An engineer by training, he believes modern technologies and innovation can bring quantum improvements in the environment. Dr R.A. Mashelkar heads the iFOREST board.

SHREY GUPTA

Bhushan was with CSE for 22 years. He was handpicked by the late Anil Agarwal and was a disciple who learnt from him how to be combative and collaborative at the same time. After Agarwal died, Bhushan worked closely with Sunita Narain on several impactful campaigns. He led many of CSE's research programmes.

We spoke to Bhushan on his plans for iFOREST and how he sees the path ahead through the maze of India's environmental problems.

You are leaving CSE after 22 years. After having worked closely on so many frontline issues what will you be doing now?

I had a wonderful journey at CSE. As an institution we achieved many milestones especially at a time when environmentalism in India was at a very nascent stage and people didn't have information. That's when Anil (Agarwal) came in with the *State of India's Environment* report, *Down to Earth* began as an environmental magazine and research teams were set up at CSE. Some basic environment laws and regulations were put in place. CSE was at the right place at the right time, poised to become one of the leaders of the environment movement in India.

Today the language of environment has been mainstreamed. Everyone talks of environmentalism and every government has a paper on the environment. The challenge is how do you scale up implementation.

I have been thinking about this for quite some time. The era of top-down policy is over. The question is, how do you convert policy into a scaled-up model for implementation?

That is the real challenge the country faces today and that is what motivated me to embark on my next journey where I could look at policy design and, more importantly, at innovation. I think we are in an era where technology is available for large-scale innovation and scaled-up work in the field of environment.

So, policy design, innovation and scaled-up implementation — these are the three core pillars we will be building on.

You have worked closely and fruitfully with industry. Based on this kind of experience what are the areas you would focus on?

Absolutely. I was fortunate perhaps to lead the only programme in the environmental movement in India which engaged fruitfully with industry on the same platform, at the same level. When I was releasing the Green Rating report on the cement industry I was speaking to industry leaders and Anupam Mishraji was sitting in the front. Post the report's release he came up to me, took my hand and said, "This is Gandhism at its best".

At that time I didn't understand what he meant. Later, I realised he was essentially saying that speaking truth to power is what Gandhi did. The Green Rating project did exactly that.

We spoke truth to the most powerful industrialists

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in India. Initially, they were resistant. But once they understood the unbiased nature of the rating and the foundation of goodwill it had for industry and the environment, they all came out to support us — from Gautam Thapar to Harsh Pati Singhanian to Yogi Deveshwar...

In fact, Deveshwar was a big fan of the Green Rating project. Recently, after his passing away, I met some of his colleagues from ITC. They narrated a story which really warmed my heart.

In our first paper industry rating we had given the worst rating to ITC. Deveshwar called a board meeting in which he said, Who the hell is this Chandra Bhushan who says we are the worst paper plant in India. The next time he rates us, make sure we are the best. And that is exactly what happened. Four years later, when I rated ITC again, the company had the best paper plant in India.

This tells me that without engagement with industry and businesses you cannot improve environment in India. Environment cannot be solved by government alone. In fact, I always say environment is too important to be left to the government. We need industry engagement, financial sector engagement and public participation. Only then will we be able to resolve environmental issues.

One of the pillars of our work will be green economics. How do we green, not only industry, but the financial sector so that there is market support for the environmentalism that we want.

To take it to spaces where strife happens?

I would say to take it to uncomfortable spaces for environmentalists like me.

Like?

See, one of the problems in the environment movement is that we do not know how to engage with businesses. It's very easy for other environmentalists to accuse you of being on the side of business even if you are engaging at the same level, even if there is no financial transaction. So it's a very uncomfortable space to be in.

But the Green Rating project taught me that the way to navigate that uncomfortable space is to be open and transparent. So for the Green Rating project, every letter I wrote to industry or received from industry, every report that we published, I would get put up on the website. Then there was no scope for any kind of negative publicity to happen.

When you talk of NGOs and activists being adversarial for a long time, actually industry, even now to some extent, is adversarial in its own way. Despite that, in 22 years you have seen a change. Absolutely. I have seen change. I have seen a time when no industry had an environment policy, when in the corporate boardroom, environment was not discussed. Today, every industry I go to has a subcommittee on environment and sustainability.

That's a big change.

It is. People are discussing environment in their boardrooms which is a tremendous change. That discussion has to also become more real and more implementable. I am quite hopeful in an era of climate change, industry is realising that their businesses are at stake. One episode of extreme

'I always say environment is too important to be left to the government. We need industry engagement, financial sector engagement and public participation. Only then will we be able to resolve environmental issues.'

weather can wipe out a plant. Think about what happened in Pune, Patna and other cities. There were plants that were wiped out. So I think industry is realising that climate change and other environment issues are a threat to business.

Will climate change be one of the key areas you will be taking up?

Yes. We will be very engaged in the climate change movement because the solutions to climate change are going to be extremely challenging. We have to change the energy system.

But that's a big issue.

Actually, changing the energy system is the easy part. We have the technology. We have wind and solar and we already live in a battery world. I mean, can you live without your mobile and laptop? So we

'We have decided to work on four pillars in an integrated way. The first is livable and sustainable cities.'

are living in a battery world except that it has to be enlarged. The question is: how do you produce steel and cement? How do you produce food? How do you transform the transportation sector and the aviation sector? These are the big challenges we face and these are also core industries.

So what will you be working on, initially?

We have decided to work on four pillars in an integrated way. The first is livable and sustainable cities. Globally, more people live in cities already. I'm quite sure that when the 2020 census results come in 2022, you will find 40 to 50 percent of India's population living in cities. So cities are going to define the sustainability of the nation. Not rural areas.

The second pillar, which I am very excited about, is an integrated programme on agriculture, land, forests and water. See, most environmental problems focus only on land management. Everything is about land. We will discuss climate change adaptation and other issues.

The third is energy and climate change. We will be discussing transition. It is an irony that climate change will lead to huge transfer of wealth. The poorest part of India is where the coal is and the richest part of India is where renewable energy is located. If you close down coal mines, what happens to the Jharkhonds and Jharias? They are polluted, it is true, but there is economic activity happening there. How do you make the transition from coal to

renewables without disrupting livelihoods in poor regions?

What do we do about coal?

I think we have 30 years to close down coal. Whenever someone says close down coal I give them a perspective. I tell them to think about 30 years ago. We had floppy discs, then. Today, we have more computing power than Apollo 11 in our hands. Thirty years is a long time for the world to change. There is also pressure for change to happen.

My sense is you have to build an alternative economy and industries in those areas. Coal will not end because we have renewable technology. Coal will end if there is political support and grassroots support to say, yes, we are now ready to transition from coal.

The fourth area is green economics where we will work very closely with the financial sector and industry.

In terms of coal, and this is so important to the nation, what do we do in the interim? Obviously, it makes sense to use our coal but at the same time you live in a warming world.

It isn't just about India closing coal. It's about the world moving away from coal. What should be the principle on which this should happen? And the principle I have arrived at is based on depreciation. If a plant has depreciated — covered its capital, interest, benefits... then it should be closed down.

If you draw a map of the world and place all the coal plants according to depreciation, you will find the oldest plants, whose average age is 40 years, are in the US. So it is immediately possible to start closing down US plants. There is Europe which also has old plants. If we use this principle then India should perhaps start closing its plants from 2030 and complete this process by 2050.

But during this interim period what should we do?

I think we should promote clean coal, high-efficiency utilisation of coal, reduce our T&D losses — we lose 30 percent of our electricity — and improve energy efficiency so for every unit of coal we get more economic and social output. This is what the roadmap should be and we have 30 years for this transition to take place.

Who do you think will fund iFOREST?

It will remain a publicly funded organisation. I do not see the colour of money. I see its quality. So even if it is less money it should allow you to do good work. We need money with patience. Right now the money that comes to the NGO sector doesn't have patience. The funders want a report the very next month. In this field, if you want to do good work you need money with quality and patience. My board is very keen that we raise as much Indian money as possible. ■

Pickles from a family tradition

PICTURES BY SHREY GUPTA

Kavita Charanji
Gurugram

VIKRAM Bhargava's hobby was making pickles at his family farm in Paharapurwa village, in Rajnagar *tehsil* of Madhya Pradesh. His forte was a tangy mandarin orange pickle that he made from the oranges that grew copiously in his backyard. He gifted his handmade pickles to family and friends who loved them.

Bhargava's daughter, Niharika Bhargava, a postgraduate in marketing strategy and Innovation from Cass Business School, London, sensed a business opportunity in her father's hobby.

She had worked for a public relations company, Edleman, as an accounts executive, and resigned after six months. "I always wanted to do something of my own and I hated my job," she recalls.

The family farm gave Niharika the right opportunity. She decided to scale it up and launch a commercial venture in pickles. She did solid homework in market research and branding for six months.

In 2016 Niharika decided to take the plunge. She launched The Little Farm Co which has expanded its product line impressively. It now produces a range of organic pickles, dips, chutneys, salad dressings and superfoods. Zingy, free of artificial preservatives and additives, the handmade products reach the table fresh from the farm and are selling very well.

"Traditional pickle making is a dying art in India. This is especially true of Tier 1 and Tier 2 cities where people simply don't have time. The pickles you see in the market are full of chemical preservatives and additives. They don't have the same taste and appeal as homemade pickles," says Niharika.

The Little Farm Co's pickles and chutneys are hot-sellers, especially the mandarin orange pickles. But others do well too. There are jalapeno pickles with a twist, lemon chutney, amla chutney and garlic chutney. All the company's products are free of processed sugar. "The only preservatives we use in our pickles are jaggery or jaggery powder, raw sugar, sugar cane vinegar, cold pressed mustard or sesame oils and spices," says Niharika.

The farm grows its own fruits, vegetables, oils and spices. "Our farm is bordered by government-owned forest land and a clean river. We don't use any chemicals and fertilisers. Even neighbouring farms don't use any pesticides that can seep into our farm."

The Little Farm Co's pickles and preserves are all artisanal. Nothing is made in a factory. The village farm has a workforce of 15 farmhands, 13 of whom are women from the vicinity. The women are pros at organic farming and pickling. One woman has, in fact, come up with a recipe for The Little Farm Co's iconic jalapeno garlic dip, says Niharika.

Fruits and vegetables are plucked ripe from the farm only two hours before pickles are processed. The main production machine at the unit is a mixer-grinder. The pickles are sun-dried in open spaces and then packaged at The Little Farm Co's small unit in Gurugram.



Niharika Bhargava: 'Traditional pickle making is a dying art in India'



The Little Farm Co produces organic pickles, dips, chutneys and more

The company has sourced 20 pickle recipes from family members and friends. Elders have pitched in with recipes.

"We felt that women weren't really making pickles at home anymore. They didn't have the time or knowhow. We perceived a big market. My father and I made the rounds of exhibitions to sell our pickles. They were a complete sell-out and that really encouraged us to go further," she says.

Recipes for The Little Farm Co products gradually came by. The company has sourced 20 pickle recipes from various family members and friends. Elders have pitched in with traditional recipes.

The Little Farm Co. has also diversified into organic raw ingredients. Orders pour in for superfoods like high protein chia seeds, sunflower seeds, flax seeds. Sugarcane vinegar, oil and spices fresh from the farm are also much in demand.

Niharika shuttles between Gurugram and Paharapurwa. She is in constant touch with horticulturists to expand the company's product line. The farm grows moringa, a high-protein shrub. Plans are also afoot to revive more local seeds and take a wide range of millets to the market.

The Little Farm Co largely sells its products online through the company's website. Other platforms include Amazon, Qtrove, Dastkar and Place of Origin. Niharika and her father also set up stalls at farmer markets and exhibitions. Among them are Earth Collective's Sunder Nursery market on Sundays, the I am Gurgaon Market and, further afield, farmer markets in Mumbai and Bengaluru. Recently The Little Farm Co received its first export order from the UK and US.

Niharika has pressures to contend with. "Ours is a bootstrapped company. We have an annual turnover of ₹1 crore and there is a constant need for funding and expansion. Besides, we still have a long way to go in the creation of market awareness. The major challenge we face is to enter the close-knit retail market. We are looking for a likeminded distributor for our products," she says.

The Little Farm Co has plans for a full-fledged packaging unit in Madhya Pradesh. The team pins its hopes on government funding and subsidies for medium and small business ventures. ■

Politics of foreign trade policy



IT is not surprising that the subject of India joining the Regional Comprehensive Economic Partnership (RCEP) agreement figured in the talks between Prime Minister Narendra Modi and Chinese President Xi Jinping. There has been considerable opposition to RCEP within the Bharatiya Janata Party (BJP) on the grounds that it would hurt Indian manufacturers. Even the head of the Rashtriya Swayamsewak Sangh, (RSS), Mohan Bhagwat, signalled caution on the matter, flagging concerns raised by the RSS economics wing, the Swadeshi Jagran Manch (SJM) that has been resolutely opposed not just to RCEP but to free trade agreements (FTAs) in general.

Interestingly, this is one issue on which the BJP, RSS, the Communist Party of India (Marxist) and Sonia Gandhi have been on the same page. Both the BJP and the CPI(M) had criticised Prime Minister Manmohan Singh for entering into several FTAs during his tenure in office. The anti-FTA view received indirect support from Sonia when she wrote a letter, as Congress president, to Prime Minister Singh urging him to review the government's decision to negotiate an FTA with the Association of South East Asian Nations (ASEAN). Sonia echoed the view of many in the BJP and the CPI(M) that the Indian home market was large enough for the growth of Indian enterprise and that trade need not be viewed as an engine of growth. Rather, FTAs would threaten the interests of Indian producers.

The CPI(M) had specifically objected to the ASEAN-India FTA on the ground that it would hurt plantation growers in Kerala and West Bengal. Singh had to defend himself, telling a CPI(M) delegation led by Kerala's finance minister, Thomas Isaac, and the then head of the Kerala State Planning Board, Prabhat Patnaik, that an FTA with ASEAN would also benefit the friendly communist republic of Vietnam!

In response to Sonia's letter to the prime minister, Singh had said at the time, "Our approach to regional trade agreements in general and FTAs in particular has been evolved after careful consideration of our geopolitical as well as economic interests. Although India has a large domestic

market, our experience with earlier relatively insular policies, as also global experience in this regard, clearly brings out the growth potential of trade and economic cooperation with the global economy."

Prime Minister Modi can in fact quote his predecessor verbatim back to the naysayers on RCEP within his own party. The RCEP is not just a trade deal but also an entry point into the new Asian economic architecture that China is seeking to build. Having created the Asian Infrastructure Investment Bank (AIIB) and set up the Chiang Mai Initiative, as China-led Asian parallels to the World Bank and the International Monetary Fund, Beijing is creating its own trading regime through RCEP, even though ASEAN sits in the driving seat. India is wary of RCEP because it could open the door wider to Chinese imports when the huge trade deficit it



Narendra Modi with Xi Jinping: What will the outcome be?

faces with both ASEAN and China is a problem it has been trying to resolve.

The Indian case is a strong one. India seeks an FTA not just for manufactured goods but also services and investment. India has also consistently fought for a freer regime for the movement of professionals through the so-called 'Mode 4' negotiations in the World Trade Organisation. After all, if the rules of globalisation enable free movement of goods and capital, why not free movement of skilled labour? It remains to be seen whether Modi's conversation with Xi will have any impact on the final outcome in the RCEP negotiations.

What is surprising, though, is that despite murmurs against FTAs in general and RCEP in particular, the issue has not become a platform for wider political mobilisation. Recall the manner in which the Left and BJP opposition stirred up countrywide protests against India joining the WTO. Prime Minister P.V. Narasimha Rao had to

battle the combined opposition that included socialists like Mulayam Singh Yadav and Lalu Prasad Yadav in defending the infamous "Dunkel Draft". Farmers marched in their thousands protesting against "Uncle Dunkel" — Arthur Dunkel — the European trade negotiator who had drafted the WTO agreement. It took all of Rao's persuasive powers and Machiavellian skills to get the Indian Parliament to endorse India's membership of the WTO at a time when he was still running a minority government.

That the RCEP agreement has not been a focal point for wider political mobilisation against the Union government is also a testimony to the distance Indian public opinion has travelled on the issue of foreign trade and its role in India's development. Though, to be sure, the government has also protected itself by raising tariff walls and protecting sensitive sectors.

The direction of trade policy and the debate on RCEP draw attention to the fact that India continues to pay a price for not being able to establish a more competitive manufacturing sector. The solution to the problem lies at home and there is little that trade negotiators can do when so many other developing countries are willing to participate actively in the international division of labour. Three decades after India opened up to the world, the economy still remains relatively non-competitive, though it cannot be accused of being too insular given that foreign trade now accounts for half of India's national income.

Going forward, India requires an integrated manufacturing, agricultural, horticultural and trade policy. Such an integrated policy cannot come out of a government that still functions within silos. Perhaps the prime minister should constitute a national trade policy authority under his chairmanship with a competent trade official like Hardeep Singh Puri who not only is given cabinet rank but has the power to deal with ministries that formulate domestic economic policies.

India has been a trading nation for centuries with a footprint across the Eurasian landmass and across the Indian Ocean region. To regain that status it needs a comprehensive external economic policy much like its external political and strategic policies that the Prime Minister's Office and the External Affairs Ministry develop together. Manmohan Singh created a cabinet-level Trade and Economic Relations Committee (TERC) with that objective in mind. The time has come to give that committee a secretariat and a senior minister who can act as a helmsman. ■

Sanjaya Baru is a writer and Distinguished Fellow at the Institute for Defence Studies & Analysis in New Delhi

Devices for a healthy India



MAY you live a hundred years is a traditional Indian blessing, underlying which is the thought of being healthy enough to live that long. Similarly, it is health that is first in the Western mantra of "healthy, wealthy and wise". So, one would assume that with a couple of thousand years of heritage, topped by two centuries of Western influence, health would necessarily be top-of-the-mind for governments and people in India. Yet, this is one area in which the country's performance has, over the years, been most dismal.

In addition to its physical component, health also has a mental or psychological dimension, and good health is no longer the mere absence of illness, but relates to the positive aspect of overall well-being. Even limiting the perspective to just the physical aspect, our indicators of health are very poor. Despite relatively rapid economic growth over the past quarter-century, the health scenario in India is worse than in most of our neighbours; in many cases, we compare with the far poorer countries of sub-Saharan Africa, and are way behind Sri Lanka or even Bangladesh.

Few things are as indicative of not just individual health, but the health of society, as the well-being of children. What, then, can be more damning than the fact that over a third of children under five years are stunted and a similar proportion are underweight, while 17 percent are wasted (low weight for height). A minuscule 6.4 percent of children below two get the defined "minimum acceptable diet". Even in socially-developed Kerala, the figure is just 32.6 percent; surprisingly, in all the other southern states, as also in "developed" Maharashtra and Gujarat, the figure is below 5 percent. These and other revelations emerge from the Comprehensive National Nutrition Survey commissioned by the government and conducted between 2016 and 2018.

The government has launched a Poshan Abhiyaan, aiming to attain a malnutrition-free India by 2022 — a laudable target but one that will require Herculean efforts, given the present status.

Much work, focus and funds will be required to drastically improve other key indicators like infant mortality, maternal mortality and the gender ratio. Traditional scourges like TB, malaria, diarrhoea and respiratory diseases need to be tackled too, even as more challenges are posed by newer diseases and the growing incidence of non-communicable diseases.

Apart from the nutrition mission, other schemes like Ayushman Bharat have been initiated, with great ambitions and fanfare, as was the earlier National Health Mission. Mid-day meals for schoolchildren and anganwadi centres have been operational for decades. Doubtless, these — and other efforts — have made some impact. However, it is equally obvious that they have not been able to meet the immense challenges of nutrition, care and good health. That India is a poor country can hardly be an excuse, given the performance of countries with similar per capita income, or even — within India itself — states like Kerala.

Sanitation (constructing toilets), and — more

driving those to private facilities who can least afford the costs involved.

In this otherwise depressing picture, one source of hope is technology. Advances in bio-science and new technologies are not only providing better healthcare, but are also reducing the cost of doing so. A whole host of non-invasive tests have been developed, with diagnosis possible from sweat, tears, breathing and pulse patterns or heartbeats. Alternatively, a great deal can be gleaned from a single drop of blood. Wearable devices sense and relay a patient's key parameters to a doctor or a medical facility, enabling online, continuous monitoring, so that corrective action can be advised as necessary. Lab-in-a-box equipment is now available, through which tests and diagnosis for a large number of key ailments can be done easily, in the field and at low cost. Data analytics and artificial intelligence provide diagnoses that are as good as — sometimes, even better than — that of a doctor. Satellite or drone maps combined with digitised data from the field (entered into a tablet and

downloaded to a central point) can be used to track the spread of infectious diseases and take preventive action.

Databases now provide a rich storehouse of medical information and individual experiences, which — through a search engine — enable searches and self-diagnosis. Little wonder, then, that a doctor commented that everyone is now consulting "Dr Google" rather than him! However, such databases are also of direct use to doctors themselves as an aid to better diagnosis.

There are other, already visible wonders of technology, not all of which are automatically positive or good. New technologies may lead to immortality, with all its pluses and minuses — but that is a subject for a separate piece.

The glum picture painted in the first part of this article promises, then, to be reversed by technology. However, this cannot happen by itself. Supportive policies are critical, not just for development

and deployment of new technology, but particularly to see that it is used for public good and that the disadvantaged are able to benefit. Otherwise, the inequities in our society will mean that the new opportunities will be unaffordable for the poor. Health — like food, education, shelter, livelihoods and justice — has to be seen as a basic and essential right of all, and a responsibility of the State. Only then can we hope to be a healthy — and, hopefully, wealthy and wise — country. ■

Dr Kiran Karnik is an independent strategy and public policy analyst. His recent books include eVolution: Decoding India's Disruptive Tech Story (2018) and Crooked Minds: Creating an Innovative Society (2016).



A whole host of non-invasive tests have been developed, with diagnosis possible from sweat, tears, breathing and pulse patterns or heartbeats.

recently — water have seen special and welcome emphasis. However, budgets for health continue to languish at levels that are far below the stated target of 3 percent of GDP. While funds alone will not solve all the problems, it is equally clear that without adequate funding all the good intentions will remain merely that, with slow and incremental progress on the ground. The lack of public funding and the increasing privatisation of healthcare particularly affects the poor, and it is now well-established that a major cause of penury are bad-health episodes within the family. As in education, the poor quality of governmental healthcare is

Picking up the tab for elections



ELECTION TRACKER

JAGDEEP CHHOKAR

WHO should pay for elections? This is a perennial question. The theoretical or philosophical perspective is straightforward. People contest elections to perform 'public service', therefore it is not fair to expect them to spend their personal money on contesting elections. Public money should be spent for the purpose. This is what gives rise to the demand for state funding for elections. But before we come to that, a few issues need to be sorted out.

The first issue is what exactly is 'state' funding. Assuming that it means the government should pay for all the expenditure incurred on the election, it becomes important to remember where the government gets its money from. That is no secret. The government does not get its money from the printing presses which print currency. However, in the light of recent events, it may be argued that the government gets its money from the Reserve Bank of India (RBI) but then the question arises as to where the RBI gets its money from.

Without going into further argumentation, it should be easy to understand that whatever money the government has comes from the people of India in the form of taxes that the government levies on them. It is therefore more logical to call it public funding of elections rather than state funding of elections. This is not a question of mere semantics because, unfortunately, there is a widespread belief that whatever belongs to the government is free and is no loss to any of us, the citizens. As a matter of fact, one political leader is known to have given her followers the slogan: 'Jo zameen sarkari hain, woh zameen hamari hain' (That land which belongs to the government is ours). Therefore, if government financing of election expense is called public funding of elections, citizens are likely to think that it is their money that will be used to fund elections and feel greater ownership than if they think it is money that belongs to this faceless body called the government.

The second issue to be sorted out is how much money is actually spent on the elections and by whom. Possibly, the only serious estimate of the expenditure on the 2019 Lok Sabha elections is ₹60,000 crore. The same study also says that out of this amount candidates are estimated to have spent

₹24,000 crore, political parties ₹20,000 crore, the Election Commission of India and the government ₹10,000 crore, media/sponsors ₹3,000 crore, and others/industry ₹3,000 crore. The demand for state funding does not clarify how much of this amount of ₹60,000 crore should be borne by the state.

It is clear from the above estimate that about 75 percent of election expenditure is incurred by political parties and candidates. Common experience tells us that a lot of this money is spent on a variety of activities, several of which contravene the Model Code of Conduct and the law of the land. Several more are clearly of a dubious nature and are conducted out of the public eye. The idea that such activities be financed by public money is really questionable.

Above all, political parties and candidates do not,



An official explaining how an EVM works

It is estimated that ₹60,000 crore was spent on the 2019 Lok Sabha elections and 75 percent of this was spent by candidates and political parties.

and are unwilling to, disclose the actual amount they spend on elections. Both candidates and political parties are required to submit statements of election expenditure, after the elections, by way of sworn affidavits. There is concrete data to prove that the amounts shown in these affidavits are grossly understated. This creates a big dilemma: How much public money should be earmarked or

budgeted for reimbursing election expenditure? This cannot be decided with any confidence unless political parties and candidates come clean on how much money they have actually spent in the last election, which they are clearly not willing to do.

Another critical issue is, if political parties and candidates are to be given public money to spend on elections, should they be free to collect or take money from other sources? It stands to reason that once they are given public money, they should not be allowed to accept money from any other source because if they can take money from other sources it is likely to be used for questionable activities. It will then become a case of throwing good money after bad.

Now we come to factors in support of state funding of elections. The most commonly quoted report in support of this is the Indrajit Gupta Committee report which was officially titled the 'Committee on State Funding of Elections,' and was submitted in 1998. It is claimed that this committee recommended state funding of elections. The fact is that the committee suggested only partial financial support by the state and that too, only by way of bearing the cost of printing material and facilities, electronic media time, vehicles and fuel, and so on.

More important, the first paragraph of the "Conclusions" in this report is never mentioned by proponents of state funding. This paragraph reads as follows:

"Before concluding, the committee cannot help expressing its considered view that its recommendations being limited in nature and confined to only one of the aspects of the electoral reforms may bring about only some cosmetic changes in the electoral sphere. What is needed, however, is an immediate overhauling of the electoral process whereby elections are freed from the evil influence of all vitiating factors, particularly criminalisation of politics. It goes without saying that money power and muscle power go together to vitiate the electoral process and it is their combined effect which is sully the purity of electoral contests and affecting free and fair elections. Meaningful electoral reforms in other spheres of electoral activity are also urgently needed."

The "meaningful electoral reforms" that the Indrajit Gupta Committee refers to are (a) functional and demonstrable democracy in the internal functioning of political parties, and (b) financial transparency of political parties. The sad fact is that none of the political parties are even remotely interested in these two aspects. On the contrary, all political parties often come together to resist any, even a small step, in this direction! ■

Jagdeep Chhokar is a founder-member of the Association for Democratic Reforms

Let's salvage our cities



CITY LIFE

V. RAVICHANDAR

CITIES are meant to be centres of innovation and job creation. But in India we are staring at an urban apocalypse if we continue the way we are with collapsing infrastructure and weak leadership. Rajaji, Bose, Patel, Nehru, Rajendra Prasad. What did they have in common? They all cut their teeth as city leaders before becoming political titans. Post-independence we have allowed our cities to sink into neglect. The 74th Amendment, the JNNURM (Jawaharlal Nehru National Urban Renewal Mission), AMRUT (Atal Mission for Rejuvenation and Urban Transformation) and now the Smart Cities programme have barely made a dent.

There is a widening trust deficit between citizens and the government. With urban projects characterised by poor planning, lousy execution and corruption, citizens avoid paying their fair share of taxes, particularly property tax whose compliance across Indian cities is below 50 percent. And the spectacle we see in our legislative assemblies and outside do not help build confidence either. There is no easy fix and unless the leadership leads by example and builds credibility, citizens will be unwilling to be led by the pied pipers of the State that lord over the city. There is a need for a mix of bottoms up responsibility coupled with top down authority and respect for one rule of law for all.

We will need a modified game theory approach to align city desired outcomes with the differing stakeholders' agenda. For instance, one reason the Tender SURE roads in Bengaluru built around the pedestrian and higher upfront investments got traction was the increased project outlays that appealed to the system which has mastered financial extraction from contracts; the city benefits by pedestrians getting wider footpaths, no pothole formation and uniform traffic flow. This is the 'North by Northwest' approach — the best route is fly true north, but in the real world one must be pragmatic and take the necessary deviations to reach the destination.

We need to embrace a simple vision that captures public imagination, rallies the troops and acts as the basis for decision-making. My personal

favourite in this regard is, 'One day we will swim in our lakes and rivers'. Imagine doing that in the context of a Bellandur lake, a Coom river or the Yamuna. All city decisions use the 'will it help swimming' criteria for green signalling a decision or red pencilling it. This will drive initiatives like 100 percent sewerage connections, higher investment in sewage treatment plants, buffer zone planning with more public spaces, focus on public transport, encouraging walking and cycling as mobility modes, infrastructure provisioning preceding building permissions, better garbage management and so on.

We need guiding principles that aid decision-making. For instance, in the area of mobility, it has to be a focus on moving people over moving vehicles; pedestrians first on our streets; in garbage management, segregation and local processing are



Chaos on a Delhi street

The ward level, as the smallest unit of governance, should be allowed to be the 'oral democracy' voicing people's problems and aspirations.

imperative; emphasis on demand management to be as important as supply side focus when it comes to water and energy; a strategic projects focus can drive a long tail of smaller improvements across the board; public spaces, arts and culture as soft infrastructure are as important as fixing hard infrastructure; heritage potential for job creation and enhancing revenues and the like.

It is too much to expect our current city administrative set-up to be able to fix its growing problems. There is negligible human resource capacity and a need for multiple skills which are absent in government. Collaborative partnerships between civil society, industry and government will be needed. For starters, committed external stakeholders can help the authorities think through

alternative options based on citizen needs to address a civic problem and draw up a cogent, unbiased Request for Proposal that can act as the guide for tendering the right kind of project. Currently, we are badly executing poorly conceived projects. Consequently, they are doomed to fail at the outset. Just better project conception could assist in the journey to a better city.

There are a host of other measures that should be considered including reimagining the city's governance and administrative architecture. The ward level, as the smallest unit of governance, should be allowed to be the 'oral democracy' voicing problems and aspirations at the grassroots level. It is also a place where we can experiment with proportional representation — let half the seats in a ward committee be reserved based on percentage vote shares in the ward for the city corporation elections. This way, opposition voices will find play at the local level.

The city corporation should focus on decentralisation measures. This could be through multiple corporations or decentralised zonal councils so that the elected representatives are closer to their constituents. One missing piece in the puzzle is integration across multiple agencies who need to come together to make music. Currently they march to their own tunes, resulting in overall 'noise' in the system. There is no alignment of goals. An apex-level body with an integration focus is needed for all cities with a population of over a million. Finally, sans a regional development focus, individual cities improving their quality of life will be a distant dream.

Resident Welfare Associations (RWAs) are active in many cities. This augurs well since the road to a better city starts by fixing road by road, neighbourhood by neighbourhood. While lip sympathy is given to the concept of citizen

participation, there is increased pushback from citizens wanting their voices heard. This pressure needs to be maintained. Citizen activism needs to be coupled with an acceptance of what it means to be good citizens. Their responsibility needs to manifest itself in respect for the laws of the land, not littering, driving discipline, care for fellow citizens and the like. While we can blame the government for coming up short in making our lives livable, citizens too cannot shirk their role in improving the quality of life for all. Sustainable development is an oft-repeated phrase — it needs to be a lived experience. The warning signs in the climate emergency around us are an early signal to heed the message or face the consequences. ■

V. Ravichandrar, urbanist, is a self-described patron saint of lost causes.

In Adoor's footsteps?

Sasidharan's films dig out universal truths

SAIBAL CHATTERJEE

IT is no fluke that Sanal Kumar Sasidharan, 42, is one of Kerala's most feted filmmakers. He stands apart from the crowd because he does not shy away from using the medium to speak his mind. He articulates the collective angst of an entire society and culture like nobody else in the business today. What's more, he is exceptionally adept at capturing the universal in the culturally specific.

The five narrative features that Sasidharan has made thus far, beginning with *Oraalpokkam* (*Six Feet High*, 2014), are rooted in the social and political milieu of his home state. Keenly clued in to the world around him, he digs out truths that travel beyond the boundaries of Kerala and India. Sasidharan is, in that respect, a worthy standard-bearer of the kind of self-reflexive yet all-embracing cinema that Adoor Gopalakrishnan is an undisputed master of.

With the crowd-funded *Oraalpokkam*, which earned an award at the International Film Festival of Kerala (IFFK), Sasidharan performed an



Sanal Kumar Sasidharan, left, directing a film

'When I made *An Off-Day Game*, I had no idea that it would connect with a wider audience. I thought I was telling a story specific to Kerala.'

impressive high-wire act. He dovetailed the environmental repercussions of the devastating Uttarakhand floods of 2013 into the sweep of an intense drama about a man and a woman grappling with a decaying relationship. They decide to part ways. The woman disappears. The man goes out in search. Larger truths about mankind's continuing disregard for a fragile environment are conveyed cloaked in a story of two individuals who have drifted apart.

Sasidharan's second film, the far more hard-hitting *Ozhavudivasathe Kali* (*An Off-Day Game*), another IFFK award-winner, made cinema lovers around the country sit up and take note of the director's ability to go beyond the limitations of a story even while narrating one. The film lays bare the social and political faultlines of Kerala in a manner that has rarely been done before.



Chola is a thematic extension of *S Durga*

In the unflinching *An Off-Day Game*, based on a story by Unni R. and filmed without a formal screenplay, five middle-aged friends get away from the city for a booze party during a break in electioneering. To while away their time, they play a game from their childhood. As the hours go by, old wounds are opened, gender and caste prejudices bubble to the surface and altercations erupt, triggering a shocking climax.

"When I made *An Off-Day Game*, I had no idea that it would connect with a wider audience. I thought I was telling a story that was specific to Kerala. People who saw the film around the country told me how relevant it was for them too," says Sasidharan.

The filmmaker's rise has been nothing if not meteoric. In only half a decade, the lawyer-turned-filmmaker has carved a niche for himself in



Death of Insane is on freedom of expression

independent Malayalam cinema. And his fame has now spread worldwide. What is significant is that he is the sole Malayali filmmaker to have broken into leading international film festivals at a time when cinema in the state as a whole, especially its off-mainstream segment, is in the midst of a dramatic resurgence.

Chola, Sasidharan's fifth feature, was the sole Indian film in the official line-up of the 76th Venice International Film Festival (August 28-September 7). It builds upon his concern with individuals dealing with collective attitudes and biases in a complex world where nothing is what it seems on the surface.

Chola, however, is unlike his previous four films in two significant ways. It is two hours long — the longest of Sasidharan's films thus far — and it features mainstream stars (Nimisha Sajayan and

Joju George, both of whom picked up acting prizes in the 2019 Kerala State Film Awards).

"The new film," says the director, "could be seen as a thematic extension of *S Durga* (the controversial 2017 film that ran into censorship troubles but earned unstinted critical accolades wherever it played), but it is in a totally different zone in terms of style and treatment."

"*S Durga*," says Sasidharan, "probed society as a whole. *Chola* is more about characters. The two films address the same issue, but they approach the theme from vastly different standpoints."

In *S Durga*, the only Indian film ever to win the Tiger Award at the International Film Festival of Rotterdam, a migrant girl and a Keralite boy are on the run at midnight; in *Chola*, a schoolgirl, her boyfriend and another man are out on a joyride. An incident takes place and the joy goes out of the ride.

In Venice, *Chola* (English title: *Shadow of Water*) competed for the Orizzonti (Horizons) Prize. It is the first Malayalam film in the section since Gopalakrishnan's *Nizhalkuthu* (*Shadow Kill*, 2002).

The maverick filmmaker, never one to lose a chance to jump into a debate, regrets that his fourth

Death of Insane delves into the perils of being a dreamer and a free thinker in a system that dreads individual freedom.

feature, *Unmadiyude Maranam* (*Death of Insane*), which he made in reaction to the assault on his freedom of expression as he sought to get *S Durga* out into the world, has not got the exposure it should have despite being received with enthusiasm by critics and cineastes.

Death of Insane delves into the perils of being a dreamer and a free thinker in a system that dreads individual independence. "I want the film to be seen in the form that I have made it. I haven't therefore submitted it to the censors," says Sasidharan. He said, however, that *Chola* will go into proper theatre distribution.

For an uncompromisingly independent filmmaker, Sasidharan, who is already working on his next film in the hills of Himachal Pradesh, is remarkably prolific. "This would not have been possible without the support that I receive from people around me," he says.

He singles out Shaji Mathew, the producer of all of his films and the proprietor of the Delhi-based Niv Art Centre, as one of the key forces behind him. "He gives me complete freedom," says the director.

Sasidharan, as the secretary of the Kazhcha Film Forum, has created an independent film festival that runs parallel to the well-regarded International Film Festival of Kerala (IFFK). The festival began in 2017 to counter IFFK's "inconsistent" treatment of independent Malayalam cinema.

With *Chola* earning a Venice premiere, Sasidharan now has the world under his feet. ■



Landless depicts the unequal relationship between upper caste landowners and Dalit labourers

Being landless in Punjab

ARANYA SAWHNEY MALIK

IT is a metaphoric question that *Landless* begins with: Do scarecrows have their own land? The film depicts movingly the struggle of Dalit labourers in Punjab for land and a life of dignity.

"I consider myself part of the Dalit community of landless labourers and I have made this film for myself," said Randeep Maddoke, producer and director of *Landless*, at a screening organised by the Foundation of Indian Contemporary Art in Delhi. "The way I talk and act is the language of the film."

An activist with the Punjab Khet Mazdoor Union, Maddoke is a photographer and documentary filmmaker. He currently teaches at Lovely Professional University in Punjab. He worked in the past as a landless labourer and then went on to study at the Government College of Art in Chandigarh.

Landless is the outcome of a photography project Maddoke began in 2005 after Bant Singh, the heroic bard of Jhabbar village and an activist with the Mazdoor Mukti Morcha, was brutally beaten up and mutilated by upper caste Jat men when he dared to fight for justice for his daughter who was gangraped.

The film has been shot mainly in the Doaba region of Punjab. The agrarian crisis and its impact, farmer suicides, contract labour, social boycott, moneylenders are all depicted in the film.

Punjab has the highest proportion of Scheduled Castes in ratio to the state's population with 31.9 percent Dalits. But very few own land. The Punjab Village Common Lands Regulation Act of 1961 reserves one-third of common land in villages for Dalits. But this land has been encroached upon by upper-caste landowners. During land auctions held yearly to give land to Dalits, they put up dummy Dalit candidates and bid at a higher price.

The Zameen Prapti Sangharsh Committee (ZPSC), a Dalit movement for land rights, is campaigning to ensure fair bidding for land through vigilance and protest demonstrations. The protests began in Sangrur region and then began spreading. Upper-caste landowners hit back by preventing Dalits from using common lands or

accessing the local dairy.

The film begins by depicting the unequal relationship between upper-caste landowners and Dalit labourers. The upper castes think they own not only the land but the people working on it as well. The labourers trace the discrimination that they face to the work that they do and the fact that they don't own land.

What emerges from the narratives of Dalit women and men are the injustices they face. "I used to think all of this was normal. Everyone in the village took it as being normal," explained Maddoke, addressing the 30 people who had come to the screening.

Women labourers in the film relate their experiences while they harvest potatoes. "We work very hard every day on these fields but we don't get the basic wage," they tell him.

A woman looks up at the sky and says: "If it rains we don't get the wages for the entire day, even if the work for that day is complete." Another woman says, "Our dignity is trampled on every day."

An anguished woman narrates the tragic story of why her husband committed suicide by going under a train. Stricken by fever, he didn't turn off the tube well at the stipulated time and was sacked. But he owed money to landowners. They harassed him to repay his debts and, unable to cope, he killed himself.

There are also instances of the struggle for land motivating people to set up their own enterprises. Two goat herders interviewed by Maddoke said, "Working in a small business with dignity is much better than working in a large business with your head bowed at all times."

A group of Dalit workers came together and bought a piece of land "where we work together and respect one another". One worker says, "There is no pressure here, we all work as much as we are capable of and everyone is willing to help one another."

Maddoke didn't want to mention the problems he faced in the production of the film, only saying, "I did face problems while filming but I don't want to glorify them. The actual problems are those being faced by the people you saw on-screen." ■

SUSHEELA NAIR



The hotel's beautiful lawns

The elegant Grand is green as well

SUSHEELA NAIR

IT was evening when we zoomed in to the Grand Hotel in Nuwara Eliya after a temple sojourn covering some of the important sites on the Ramayana Trail in Sri Lanka. Set in an idyllic location right next to Nuwara Eliya's Golf Course in Sri Lanka's highlands, it was an ideal place to chill out and overcome the temple fatigue. Originally meant to be the private holiday home of Sir Edward Barnes, the then Governor of Ceylon, it was known as 'Barnes Hill'. This huge old colonial hotel is one of Nuwara Eliya's major landmarks. The imposing exteriors of this hotel and time-warped public areas evoke memories of Victorian times.

This stately old building has managed to become almost synonymous with 'Little England'. In the 1920s and 1930s the Grand Hotel was the social hub for the season's activities for visitors from Colombo. It was teeming with homesick Englishmen and their mensahibs, who thronged this hotel to enjoy golf at the meticulously tended 18-hole course across the hotel, rambles through aromatic forests of conifers and a bit of game hunting. A number of European royals stayed here. It was also a popular summer retreat for expatriates and titans of the tea industry. Queen Elizabeth is said to have stopped by at the Grand Hotel to have a cup of tea during her visit to the island.

It has a Tudor façade and polished wooden frames which transport you to the 'sahib' era. Complete with hardwood floors, log fires, wooden staircases and antique furniture, the hotel exudes a colonial charm. The rooms are replete with sepia photos of a

Complete with hardwood floors, log fires, wooden staircases and antique furniture, the hotel exudes colonial charm.

bygone time and red fireplaces. The public lounges are furnished with heavy wooden chairs near the warmth of open fireplaces and a huge chandelier illuminates the main restaurant. The antique clocks, drawings, water colours, photos and posters which adorn the walls of the hotel enhance the colonial era feel. Undoubtedly, a piece of Sri Lankan history, the hotel has been bestowed the title of 'National Heritage' by the Department of Archaeology, Sri Lanka. Grand Hotel is now under the management of the Tangerine Group, and is only slightly altered since the British era.

Passageways lead to 156 guest rooms and suites in two main wings, the Governor's Wing and the Gold Wing, which offer views of either a neat garden or the golf course. There are three well-stocked bars, a supper club with music, an *al fresco* Indian restaurant during the day and a counter for takeaway food. One can savour a taste of history with high tea on the lawn.

The billiard room flaunts Sri Lanka's oldest

billiard tables. These tables were brought from London to India and fitted with patent 'Burwat Steel Vacuum'. At the Public Bar, one can experience a nostalgic environment, a gently crackling fireplace, all setting the tone for you to enjoy your favourite drink in the bar. Try the no wheat and no meat menu at the *al fresco* Mindfulness Café.

GREEN INITIATIVES: An avenue of lofty fir trees lines the drive to the entrance. The most remarkable feature of the hotel is the immaculately manicured garden with well-tended hedgerows and lush lawns which have bagged innumerable awards for 30 consecutive years. It is one of the oldest gardens in Sri Lanka. The garden is a riot of colours, spilling with salvias, anthuriums, marigold, pansies, gerberas and chrysanthemums.

A large number of plants found in the garden were introduced from Europe over the last century and a half. One of the secrets of maintaining the garden in impeccable condition all through the year is the plant propagation and nursery management techniques which have been passed down through generations of gardeners.

Explaining the hotel's contribution towards environmental conservation, Refhan Razeem, the hotel's general manager, said, "Some of our noteworthy programmes include organising monthly conservation programmes such as tree planting to create a habitat for endangered animals, a reforestation project at Black Pool in a five-acre plot of land infested with an invasive plant named Sikkim knotweed. A group of youth working for the hotel launched a campaign to eradicate the use of single-use polythene in Nuwara Eliya. Usage of plastic straws, shopping bags and also single-use plastic have been discontinued in the hotel."

"The treated wastewater from the Sewage Treatment Plant is used for the garden. Wet food waste is used as feed in the Hotel Farm as pig food. Zero food waste is practised in the hotel. The indoor pool and spa use natural lighting. The pool is designed to save energy in water heating by installing double glazed glass windows, doors and roofing. The employee restaurant has introduced two no-bin days per week, where no food is wasted by the employees as there are no waste bins," he added. The Grand Outdoors unit of the hotel promotes nature and adventure activities such as trekking, birdwatching, fishing, cycling, air rifle shooting and so on.

Resuming our Ramayana Trail, we visited Hanuman Temple, Gayatri Peedam and Seetha Eliya. The Seetha Amman temple here is built in typical South Indian style, with stucco images from the *Puranas* and scenes from the *Ramayana*. Three idols were discovered here a century ago, one of them of Sita. We saw the sanctum for Hanuman, the monkey god who vowed to return Sita to Lord Rama. We descended to the rocky stream below to have a look at a giant footprint, said to be Hanuman's, before we left Nuwara Eliya. ■

FACT FILE

Sri Lankan Airlines operates regular flights from major Indian cities to Colombo. From there it is a three-hour drive to Nuwara Eliya.

What to buy: Ceylon tea at Blue Fields shop and also spices.

Heroes of a terrible flood

CIVIL SOCIETY REVIEWS



Rowing Between the Rooftops: The heroic fishermen of the Kerala floods; Rejimon Kuttappan; Speaking Tiger ₹299

DISASTERS make headlines and are remembered because of the disruption they cause. Life just can't be the same after an earthquake, flood or fire — till, of course, survivors move on and the next generation has no reason to look back.

But what about rescuers? The heroes of the day, who put their own lives at risk to save others. How much space is there for them in public memory? Do people on the verge of death ever remember the people who saved them? Do

they go back to say thank you and help them in their lives? Do governments reward them adequately? The answer is mostly no.

In the floods that swamped central parts of Kerala not so long ago, fishermen went from the coast to the interiors and saved thousands of lives. They took with them their boats, their unique knowledge of dealing with currents and waves and their hardy bodies with enormous reserves of strength.

The fishermen went with resolve and a spirit of service. They left behind anxious families who depended on the meagre earnings of these men from fishing. Had something happened to them, their families would have been destitute — down from very little to nothing.

The call to serve came from the government on loudspeakers and TV and through the churches. It was just an appeal and they need not have heeded it. There was no compulsion to go. But they went, at no notice, without telling their families who would have almost certainly tried to hold them back for fear of their safety. They took their own boats or borrowed boats, put them on trucks and travelled several hours to the flooded areas.

So heavy had been the rain that swirling water had submerged the lower floors of residential buildings and in some cases gone over the roofs. These were wealthy areas — Gulf earnings had been used to build lavish homes where elderly parents lived in isolation.

By contrast, the fishermen came from shanties on the coast with dwindling incomes from fishing and mounting debts. It is a great irony that people with so much wealth should have been so helpless and the fishermen with very little should have had the fortitude and indomitable spirit to contend with nature's fury.

The fishermen had just recently had their lives thrown into turmoil by Cyclone Ockhi. Boats and lives had been lost. Some of them had spent two and three days in the turbulent sea, buffeted by giant waves but keeping themselves afloat by treading water and hanging on to the remnants of their boats, their bodies bruised and battered, till they were rescued. They hadn't recovered from Ockhi's battering but joined in the rescue readily, putting their lives at risk again.

In this outstanding book, Rejimon Kuttappan has



The fishermen went with resolve and a spirit of service. They left behind anxious families who depended on the meagre earnings of these men from fishing. Had something happened to them their families would have been destitute — down from little to nothing.

told the stories of these fishermen whose courageous feats made news at the time of the floods but deserved to be remembered with something more substantial and respectful of their efforts than the day's papers and TV shows.

Speaking to the fishermen much after the event, Kuttappan's narrative carefully stitches together the events of those days when the floods were at their worst and every hour was valuable in getting people out of their homes and into boats and reaching them to relief camps.

The fishermen would be navigating neighbourhoods they knew nothing about. They would take a policeman or some local person along. Many a time the boats would get stuck in iron gates and even on rooftops. They would dock at buildings, use ropes to climb to higher floors and carry people down. It wasn't easy because how do you bring down into an unsteady boat a heavy old person who doesn't know to swim or a pregnant woman who is almost ready to give birth and has her other children clinging to her.

The book also goes beyond the events of those days to introduce us to the fragile existence of the fishing communities. Mechanised fishing has impacted the incomes of traditional fishermen, forcing many to become daily labourers. They have

growing debts that they can't settle and no access to affordable healthcare and reliable housing.

Kuttappan goes into the personal lives of the fishermen. The unpaid debt, the sightless child, the shattered house. These men were heroes of the central Kerala floods. But back on the coast they were vulnerable and struggling against the everyday odds of running their lives and fending for their families.

Kuttappan's book is an example of how journalists should go beyond the sensational to explore the multiple layers of a story. The fishermen are both heroes and victims in a flawed system. As heroes they make good for the government, which doesn't know to deal with disasters. As victims they suffer because of the callousness shown towards their needs as productive citizens with a traditional skill.

We should look back on disasters because there is a lot to learn from them. The obvious lesson from Kerala is that India needs to prepare for the vagaries of changing weather patterns. We can also see that our urbanisation is flawed and building as we do in our cities, we invite tragedy to strike. But most of all Kerala's flood should awaken us to the strengths of a composite society — the fishermen were Christians and they were saving Hindus and Muslims without a thought about which religion they came from. ■



**AYURVEDA
ADVISORY**
Dr SRIKANTH

Nourish your liver

THE liver is a vital organ for metabolism. It can be called the engine of the body. Its many important roles include digesting, metabolising and manufacturing essential compounds for keeping the body healthy. This organ is also responsible for identifying toxins and helping detoxification.

Our liver is critical for life-long health so it makes sense to treat it well. While there have been major advances in treating liver diseases, there are no absolute cures. That's why it's important to take steps to prevent liver disease, such as making healthy lifestyle choices and getting immunised against viruses that can cause liver disease. Inclusion of some potent herbs may have an added advantage in ensuring a healthy liver.

The liver is a unique organ which can 'heal' itself most of the time. However, we must reduce the burden on it. We must remember that every time we eat we flood the liver with potential toxins along with nutrients.

Recent research points to lifestyle modifications such as diet, moderate exercise and stress management for improving liver function. Nourish yourself well. Eat good-quality, freshly cooked food when you are hungry. Do not consume food that is high in sugar and trans fats.

- Avoid overeating and refined or heavily processed food.
- Avoid excess sugar, oil, salt, spices.
- Eliminate extra carbs from your daily diet.
- Have foods rich in Vitamin E — almonds, peanuts, sunflower seeds, pistachios, spinach, mustard greens and papaya.

- Have foods rich in Vitamin D — curd, cheese, eggs, fish, mushrooms.

- Foods rich in omega 3 fatty acids are helpful — flax seeds, walnuts, soya bean, tofu, chia seeds, shrimp, fish oil.

Red rice, raisins, tender coconut water and sugarcane juice are considered wholesome for liver health. So also barley, wheat, green gram and red lentils. It is good to avoid fermented food such as vinegar and alcohol.

Remember that high-fibre diets help keep the bowels, liver and blood clean by facilitating elimination. Drinking plenty of water to flush out toxins is beneficial.

Do not skip or delay your meals. However, fasting for a day — or even just a meal — helps liver function. Fasting doesn't mean that we starve. Always stop a fast at any sign of exhaustion. Drink easily digestible nutrient-dense juices of fresh vegetables and fruits.

Avoid sugar-rich juices and sports drinks. Also minimise exposure to chemicals of all sorts — from food additives, aerosols, air pollution, cigarette smoke to caustic cleaning agents. The liver needs to break down every chemical entering the body either for use or excretion.

- Air pollution and exposure to chemicals of daily household use and other toxic substances are injurious to liver health.

Negative emotions create hormones that flood the liver with toxins. Stress can aggravate liver congestion. Regular practice of yoga, especially meditation, reduces stress and helps in optimum liver function. Take time to breathe deeply, relax, meditate, or pray.

- Exercise regularly at moderate intensity — walking 10,000 steps daily / jogging for 30 minutes should be helpful.

- Insomnia is known to cause liver imbalance. Eat early and sleep before 10 pm. Lack of sleep disturbs the metabolism of glucose, resulting in weight gain. It has also been linked to an increase in anger.

Fatty liver disease, which usually accompanies obesity, is the physical manifestation of a 'sluggish liver' — the liver is literally clogged with undigested fat! Unfortunately, there are no visible signs or symptoms in the initial stages. Most often fatty changes in the liver are detected during a routine health check-up.

There are herbs that support liver function and help reduce this congestion. Some of them increase bile flow, others support the enzymatic detox processes and some help stabilise the liver.

HERBS: The following herbs as supplements keep the liver healthy and disease at bay.

Triphala: About 20 ml of decoction with a teaspoon of honey, twice daily before food (or 2 tablets twice daily).

Trikatu (combination of black pepper, Indian long pepper and ginger): About 1 gm powder to be consumed with honey/water after food (or 1 tablet), twice daily.

Haridra (turmeric): About 2 gm of turmeric paste mixed with 3 teaspoonfuls of Amalaki (Indian gooseberry) juice could be administered once or twice a day (or 1 tablet each of Haridra and Amalaki, twice daily).

Pippali (Indian long pepper): Consumption of 2 gm of long pepper powder with a teaspoonful of honey, once or twice a day for about a month.

Bhumyamalaki, Katuki, Kalamegha, Kiratatikta: All these bitter herbs are established hepato-protectives — 5 to 10 ml of fresh juice / 2-3 gm powder of any of these herbs can be taken along with honey.

Triphala, Trikatu, Haridra and Amalaki are available in tablet form from Himalaya Wellness. **Liv. 52 DS (Himalaya):** 1 tablet, twice daily, or Arogyavardhini vati (any reputed pharmacy) 2 pills, twice daily for about 6 months, will be helpful in setting right a sluggish liver. ■

Dr Srikanth is a postgraduate in Ayurveda and has been a consulting physician for the past 19 years. He is currently National Manager, Scientific Services, at The Himalaya Drug Company

PRODUCTS

Chanderi times

A sari *mela*, organised by Dastkar, brought weavers from all over India to Delhi. Among them was Yakooob Ansari whose Chanderi saris attracted buyers because their colours and weaves were so trendy. There were saris in beige, onion pink, mint green, light blue and lavender with zari *bootis* and pretty borders. Also on offer were saris in brighter hues.

Chanderi is actually a historic, rocky town on the banks of the Narmada. It is the birthplace of the wispy Chanderi sari which is witnessing a revival of sorts.

The delicate Chanderi fabric has caught the imagination of designers and graces fashion ramps, season after season.

So how did Ansari catch on to the latest trend? He shrugs and says he gets customer feedback from shop owners in Delhi and Bengaluru whom he sells to. His father was a weaver and Ansari worked on the loom from childhood.

But he realised his modest output of saris wasn't yielding profits. So



he got together a group of 37 to 40 weavers who were working alone like him. They now work shoulder to shoulder, weave more saris and make more money.

Loans from banks and money lenders are never taken, he says, but his order and supply chain does extend credit. Prices of saris range from ₹3,200 to ₹15,000.

Contact: Yakooob Ansari, Bankar Colony, Chanderi – 473446, Madhya Pradesh Phone: 8103119113

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