

# Civil Society

## PUNE THEN & NOW

An ecological map shows what the city is losing and how fast

**GREEN SPACES - INSTITUTIONAL GREENS**  
Many multi-faceted green spaces such as institutions, parks and open spaces are scattered across the city. They are not only a source of recreation but also play a vital role in improving the quality of life. The number of institutional green spaces is declining due to urbanisation and the loss of open spaces.

**SHIVAJINAGAR HILL**  
This hill is one of the oldest and most prominent hills in Pune. It is a natural landmark and a popular spot for picnics and recreation. The hill is covered with dense forest and is home to many rare species of plants and animals.

**BANER HILL**  
Baner Hill is a prominent hill in the Baner area of Pune. It is a natural landmark and a popular spot for picnics and recreation. The hill is covered with dense forest and is home to many rare species of plants and animals.

**VETAL HILL COMPLEX**  
The Vetal Hill Complex is a natural landmark and a popular spot for picnics and recreation. The hill is covered with dense forest and is home to many rare species of plants and animals.

**WATER BODIES**  
Water bodies are an essential part of the city's ecology. They provide a habitat for many species of plants and animals and play a vital role in improving the quality of life. The number of water bodies is declining due to urbanisation and the loss of open spaces.

**FLORA AND FAUNA**  
Pune is home to a rich diversity of flora and fauna. The city is surrounded by dense forest and is home to many rare species of plants and animals. The loss of green spaces and water bodies is threatening the survival of many of these species.

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# IN CIVIL SOCIETY EVERYONE IS SOMEONE

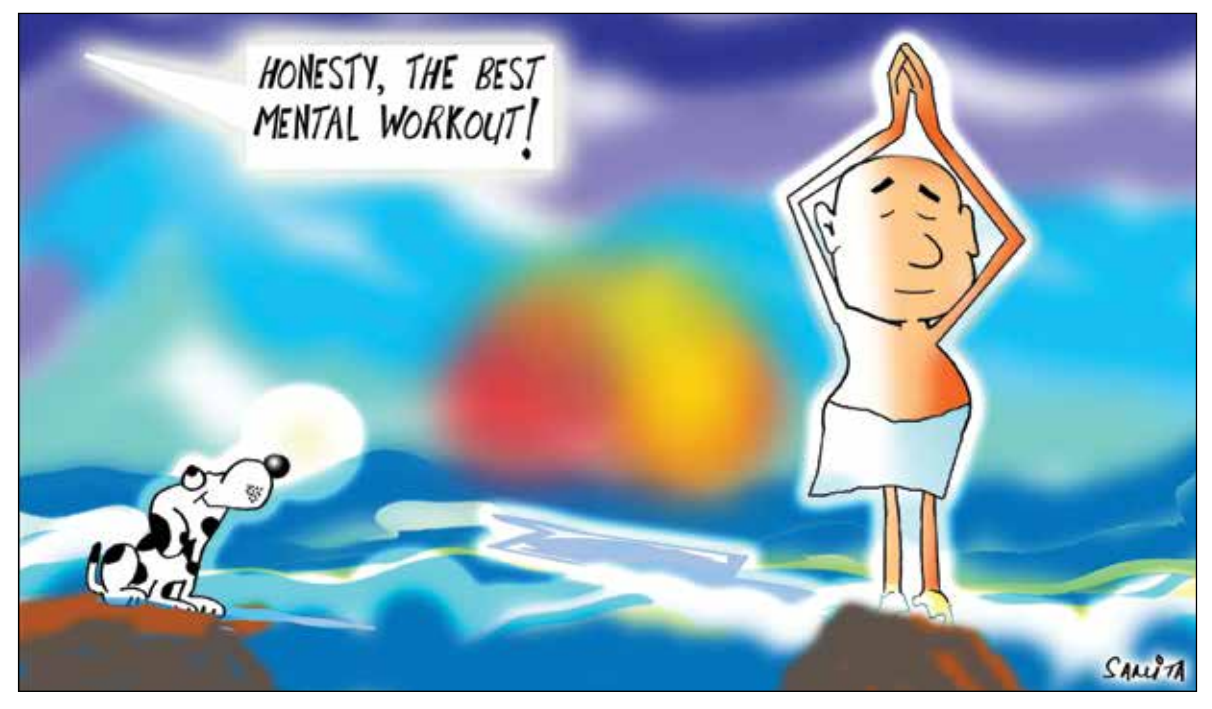


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IN THE LIGHT

SAMITA RATHOR



LETTERS



The urban PHC

Thanks for your cover story, 'Smart urban PHC'. This is a landmark project aimed at improving the health, quality of life and peace of mind of the people of Nagpur. The Tata Trusts should be congratulated for selecting a project which includes social engagement and community responsibility. Ambience, facilities, infrastructure and a welcoming, well-informed staff are real positives. I truly admire the efforts of the three doctors. Over a period of time, primary health centres will evolve into family health centres thereby reducing the burden on bigger hospitals and creating a culture of being responsible for one's own health.

Dr Vinod Menon

Hats off to the dedicated Tata Trusts team. It is good that the municipal corporation and the Trusts, working

together turned around PHCs in Nagpur. Once infrastructure, atmosphere and trained staff are there it is a pleasure working for the poor. We can put our heart and soul into this work.

Dr B. Alli

Airport mess

Many thanks to Derek Almeida for his story, 'Rainbow Warriors get new airport EIA annulled'. Most of us sit in our comfort zones and allow Goa to be desecrated by selfish entrepreneurs. Mopa is not for the benefit of Goans. The warriors deserve not just lip service but all kinds of support.

Celina Almeida

This report by Derek Almeida is excellent. We are not against the development of Goa but it should benefit the whole state and not certain parties. I was told many people bought land along the highway and surrounding areas of the project and it is these people who are pushing for the new airport. If the environmental clearance was obtained with wrong information and by not disclosing that 54,000 trees would be cut down and water and wetlands affected, then the clearance should have been revoked immediately. There is so much politics and corruption involved in this huge project. I hope the Supreme Court looks at all the current facts

Vimala Ramachandran

and makes the right decision for Goa. Joao Soares

City flora

Apropos your story, 'Urban forests, grow one in just three years.' I have lived a reasonably good life but I wish I could do some selfless work for the environment. Climate change, the scarcity of water and pollution of horrific proportion has left us fearful of what the future holds for the coming generation. I would be very interested in doing whatever I can for the regeneration of nature.

Manju Dhall

NEP draft

I read your interview with Madhav Chavan of Pratham, 'Education policy doable but will it get done.' He sounds positive. I am happy that many commentators are taking a constructive approach to the draft National Education Policy (NEP). Where I think we need more debate is on teachers. We cannot underestimate the importance of good education and training to become a good teacher. Governments went in for contract teachers — appointed in an ad hoc manner — because they (like Chavan) did not think education and training are important to become a good teacher. Incremental training is not enough. Mastery over subject knowledge is important. Yes, I agree that our education system is going through a deep learning crisis at all levels. However, lay persons cannot handle classes beyond the first two years without subject knowledge.

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COVER STORY

PUNE THEN & NOW

Pune has been growing rapidly from a leafy laidback city to a bustling and congested metropolis. Along the way it has been losing its green cover. An ecological map tracks what has gone.

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Tracking cities

CITIES have a major role to play in India's economy, but there is little that we can say we reliably know about them. Most cities have grown this way and that and problem has been piled upon problem. Over time, urban India has ended up being a gooey mess.

The newer and smaller cities are perhaps slightly better off because they can learn from the failures of the older and bigger ones. But in the absence of a contemporary urban vision and information that captures the rapid changes taking place, cities in India seem to be generally headed nowhere.

There is also a dire lack of expertise in government which must shape urban spaces so that they are inclusive and accessible to everyone. There is some kind of expertise in the private sector, but it is driven by narrow considerations. Missing is the inventiveness needed for the transformational opportunities that urbanisation offers. It is a dismal picture and especially worrying because cities elsewhere in the world are drivers of growth and prosperity. From them come innovations and new technologies. India is being left behind.

The ecological map of Pune featured as our cover story is a good example of the watchful eye that can be kept on Indian cities. Cities that lose their green cover and natural systems are invariably in a kind of trouble that is both difficult and expensive to fix. Nature is an essential component of urban living for both the poor and rich alike. Keeping river systems, water bodies and forests alive is important. Anyone who has visited Pune over the years will know the decimation that has taken place.

The Pune map comes from the Landscape Foundation India. Its founders are Geeta Wahi Dua and Brijender Singh Dua, public-spirited landscape architects. The Pune map was preceded by one on Delhi, which we also featured as a cover story. The Pune map was put together by architects in Pune and the credit for it goes to them though the entire process is, of course, guided by Geeta and Brij. A map on Bengaluru is coming soon.

The maps are important because they look at nature and history. We should know what is falling or has fallen off a city's map. The maps are also reminders of community efforts and traditional systems, which once served people well and could do so even today if reassessed and revived and adapted to current needs.

The Delhi government's plan for reviving tanks and lakes is an example. In an interview Ankit Srivastava, technical advisor to the Delhi Jal Board, tells us that more than a hundred water bodies are being revived in an effort to raise groundwater levels in Delhi. Finally, there is no substitute for nature's way.

We are also happy to present Dr Pallab Ray who has just recently headed a study on antibiotic resistance in microbial organisms. The problem is a serious one, but Dr Ray tells us it is not unmanageable. Education and regulation can restore order over time. We need antibiotics for sure, but we also need microbes. Once again fitting into what nature intended is the solution.



Dr Pallab Ray: 'Every person should ask the doctor whether he really needs an antibiotic'

# 'We need to bring bacteria back and stop sanitising everything'

Dr Pallab Ray explains the findings of a study led by him on resistance to antibiotics among Indians

Raj Machhan  
Chandigarh

IS the irrational use of antibiotics leading to a public health emergency? Are Indians heading for a situation in which life-saving drugs won't work on patients who desperately need them? A scientific study under the Indian Council for Medical Research (ICMR) has both good news and bad. The situation is not as bad as earlier (perhaps less rigorous) studies had made it out to be. But it is also true that antibiotics are being used too casually for the general good. Left unchecked, this trend could lead to a major problem. Better regulation and education of medical professionals is the answer together with a holistic approach involving humans, animals and agriculture.

The findings of the study, led by Dr Pallab Ray, professor of microbiology at the Post Graduate Institute of Medical Research and Education (PGIMER) in Chandigarh, were made public in June. They made sensational headlines, but for the wrong reasons. The scientific nuances of the research had not been fully understood. *Civil Society* spoke to Dr Ray at length for better understanding.

**Your research findings are very worrying. How confident are you of your findings and what are the implications for public health?**

I won't say that we have done something for the first time. There have been earlier studies, though they were smaller. But this particular study is a part of the Indian Council for Medical Research's

antimicrobial resistance surveillance network study. ICMR has very strict protocols. That way this study is much more advanced as it meets all the scientific parameters set by ICMR.

While drawing conclusions from this study, I want to break down some myths. We need to stop sanitising everything and get bacteria back into our lives. The general public needs to appreciate the importance of microorganisms. We are on our guard when it comes to letting microorganisms into our gut (though it is a much more robust place than our lungs, which are comparatively very delicate. There are many other aspects that the general public needs to understand.

The study should not be treated as a sensationalist document. We need to interpret the results in the right context. The other day somebody rang me up

and said that one of the Hindi newspapers had reported that from now on 70 percent of the population would not respond to any antibiotic. That is totally untrue.

You must have heard about a study by Timothy Walsh from Cardiff University. He said that the New Delhi metallo-beta-lactamase 1 (NDM 1) makes bacteria resistant to a broad range of antibiotics. He showed the existence of microorganisms or bugs that were resistant to even high-grade antibiotics like carbapenems.

We did not believe it. So we tried to find out the extent (of this resistance) and, truly speaking, we found much less than what he has shown. Till now, it's not that alarming. What we found is that 70 percent of our population has at least one organism that is resistant to one of the drugs we used.

But what is more important is the phenomenon of multi-drug resistance (MDR), which means resistance to a minimum of one member each from at least three groups of drugs. Every group has got multiple drugs in it. In our study, MDR was found in only two percent of the individuals. For all others, if you had an organism which was resistant to X it was sensitive to Y.

We also studied carbapenems, which are the mainstay of treatment in hospitals. Carbapenem resistance is considered to be catastrophic. But, fortunately, we did not find very high carbapenem resistance in the population.

Having said that, we may slowly be moving towards a crisis situation if steps are not taken to control the use of antibiotics. We do not want you to stop using antibiotics altogether, but you should use it only when it is absolutely necessary and not for infections like the common cold.

**The dangers of recklessly using antibiotics are well known. Then how and why have we allowed ourselves to reach this point?**

We first have to put into the minds of people how important helpful bacteria are in our day-to-day health. The general impression is that antibiotics are lifesavers and bacteria are harmful entities. But things are much more complex than that.

A person who comes to a hospital may already have an infection or may develop an infection at the hospital. When we test it (the infection) for its sensitivity to different antibiotics, we find a lot of resistance and we lay the blame on hospitals for administering antibiotics. Now this is not entirely true because the first concept about this phenomenon is that antibiotics do not cause drug resistance. Drug resistance is a natural phenomenon in the evolution of bacteria.

Humans did not use antibiotics before the 1940s. But when the mummies that had been preserved thousands of years ago were opened, scientists found traces of antibiotic-resistant microorganisms in them. That means we do not need antibiotics to cause antibiotic resistance. It is a natural phenomenon in the evolution of organisms.

When a sensitive organism multiplies there will be one or two organisms in maybe one million or so which will have an aberrant structure. While antibiotics kill the rest of them, the aberrant organism will be resistant because it probably binds to something. This is the natural process of evolution and what antibiotics do is change the proportion. Earlier, we had, say, one organism in 10

raised to the power of six which was resistant. But when we give antibiotics all the sensitive organisms will die because they are sensitive to the antibiotic and that one organism which is resistant will keep on multiplying and that will make the dominant population. Therefore, the total load of antibiotic used at any particular place will decide the degree of antibiotic resistance, whether we take it to be a state, the country or a hospital.

We have nearly 1.5 kg of microorganisms in our gut. We can expect that a few of them will have resistance to some antibiotics. So if we give that individual some antibiotic because of some disease, the resistant organism will become the dominant one. It still lives in the gut. It's not causing any infection, but the proportion is being changed. Out of the whole quantity of stool which a person passes, two-thirds is undigested food. It is actually bacteria, of which a huge number are coming out.

**So how much responsibility rests with the government and how much with the medical fraternity?**

You must be aware by now of something called the One Health concept. This is globally in vogue. It means we have three entities — man, animals, and the environment. This means we cannot target one without targeting the others. There is so much exchange of microorganisms between the three that anything going wrong in any one of the three

examination, we have forgotten much of it. Subsequently we never get an opportunity to read (and refresh our knowledge). Whatever we knew gets mutilated by the medical representatives of the pharma companies. So, what we need are doctors who are more educated about this aspect.

Secondly, again on the medical side, we need to strengthen our diagnostics. Giving antibiotics is one of the ways of somehow overcoming the lack of diagnostics. So even if there is a one percent chance that a patient has a bacterial infection, and the doctor didn't give the antibiotic and something happens, the patient will catch the doctor and drag him to court. Secondly, an investigation takes ₹600 but a low-end antibiotic course costs ₹50 to 60. It is a cheaper alternative. To write an antibiotic prescription takes six seconds, but if I have to make a patient understand it will take 10 minutes.

**What kind of regulation do you propose? What do you think the government should do today and in a structured/programmed way, moving forward?**

We do not have well-formulated policies. For example, a well-documented policy about not to give antibiotics for ailments like common cold and re-evaluate after 48 hours. I think if we have a written document doctors can refer to, they will probably follow it.

The government has adopted a proactive approach on this. What we need is a multi-level

**'We may slowly be moving towards a crisis situation if steps are not taken to control the use of antibiotics. We do not want you to stop using antibiotics altogether but to use them only when it is absolutely necessary and not for infections like the common cold.'**

components is sure to have its effects on the others. You know, we are using huge amounts of antibiotics in animals as growth promoters.

We have growth promoters for chickens. It costs ₹2,000 for five kg. So there is a huge amount of antibiotics used in poultry, in agriculture, in animals. And those antibiotics again are actually separating out the resistant organisms in the environment and the animals. The animals will excrete in the environment and resistant organisms will go into everything that we consume uncooked, which comes from the environment. From humans, too, resistant organisms will go into the environment because open defecation is so common everywhere.

So all the three — man, animals and environment — have to be targeted.

Now part of the blame for this overuse lies with doctors. One of the very important reasons is education. Most of the time the MBBS doctors or even those who are MDs do not know much more than the person who sold the antibiotic. It's not taught from that angle in our curriculum. In the third year, in pharmacology, we study antibiotics to pass the examination. Studying to pass an examination is different from studying to apply ourselves. And by the time we get a chance to apply (what we have learnt) after passing the MBBS

policy — hospital, hospital departments and down to the unit level. There are two ways of enforcing a policy. One is punitive and you understand how it goes. Second is regulation by an authority, which monitors and advises doctors about the anomalies that may have been committed while prescribing medicines. This is known as prescription auditing.

ICMR has already started an Anti-Microbial Stewardship Programme. This programme aims to reduce usage of antibiotics without increasing morbidity. We are proving that antibiotic usage can be reduced by 50 percent without any impact on morbidity. In the US, hospitals have done this.

Many European countries have stopped use of antibiotics for animals. In India we have recommendations not to but much more needs to be done by way of implementation. For example, you will find a growth promoter contains antibiotics. It's a crude medicine and you can get two kg of it for ₹5,000. But the Animal Regulation of Antibiotics is coming up in the next couple of years. Things are moving at a very fast pace.

**For our lay readers, could you explain what the irrational and misinformed use of antibiotics does to their health?**

*Continued on page 8*

Continued from page 7

People need to understand that antibiotics have specific applications. Outside of those applications they are harmful. We have to weigh the benefits and losses of antibiotics. In bacterial infections, there is no alternative to antibiotics. But antibiotics should not be consumed casually.

Every person should ask the doctor whether he really needs an antibiotic. He ought to say: 'If you wish I can come back again after two days, but please reconsider the antibiotic.' There has to be a mass movement to sensitise the public.

Otherwise, we will go back to a pre-antibiotic era when there were no antibiotics. Excessive use of antibiotics will strengthen the resistant organisms, and a stage will come when antibiotics just won't have any effect. You can well imagine what will happen in that situation.

For children five to 15 years old, 90 percent of the infections are viral and so they do not require antibiotics. Viral infections are self-limiting. Do not give antibiotics for a virus. Antibiotics are only for bacteria and fungi.

**'For children five to 15 years old, 90 percent of the infections are viral. Viral infections are self-limiting. Do not give antibiotics for a virus. Antibiotics are only for bacteria and fungi.'**

We have many limitations while sensitising people. But fortunately, there are many limitations that can be addressed, and the effects of antibiotic use can be reversed. We have sensitive organisms. We call them the wild types. Then we have a small number of resistant organisms, the variants of the wild types.

The resistant type will have an advantage in the presence of the antibiotic. When I stop giving antibiotics, the wild type of organisms, which are the original creation, will grow back. They have much better survival ability than their resistant counterparts. So as they grow back the resistant organisms die down. In this reverse cycle, the sensitive organisms do not become sensitive on their own, but they are developed when the environmental pressure of antibiotics is reduced significantly.

We have a clear example of typhoid fever. The drugs used to treat typhoid had become redundant. The organism, salmonella typhi, became resistant to amoxicillin, chloramfenicol and trichloromaxicol. Over the past 25 years we used different drugs. In 2019, the resistance to the drugs used earlier has reduced.

The government has been active in checking the incessant promotion of antibiotics by pharma companies. WHO is acting on it. FAO is active and so is ICAR. All of them are making a concerted effort from the angle of One Health. ■

# A COASTAL ROAD WILL KILL MUMBAI'S COASTAL LIFE



The coastal road will be built entirely on reclaimed land from the sea

**Derek Almeida**  
Panaji

A 29-km coastal road by reclaiming over 90 hectares of sea was being built at breakneck speed till an order of the Bombay High Court on July 16 brought it to a halt by asking for an environment impact assessment (EIA).

The road was being constructed by the Brihanmumbai Municipal Corporation (BMC) in the face of objections raised by environmentalists and fisherfolk in Worli.

The coastal ecology with myriad creatures has had no say in the construction of this road although it would destroy their environment. Their only hope lies in green activists like Sarita Fernandes, associated with Vanashakti, one of six organisations who filed petitions in the Bombay High Court opposing the construction of the coastal road.

Fernandes is a Mumbai-based marine and coastal activist. She has a master's degree in public policy from St Xavier's College with specialisation in coastal policy.

In October-November last year, work on the south side of the highway began with large-scale reclamation which took residents and activists by surprise. "When work started on the south side we conducted a study and found that the small stretch

near Worli had 36 species of intertidal marine life. That was when we got involved," says Fernandes.

The coastal road is a 29.2-km project, of which the South phase will be built at a cost of ₹1,316 crore per kilometre. The main rationale for the road is to increase interconnectivity from the suburbs to the south-end to decrease traffic congestion on existing public roads.

Several fishing communities will lose their source of livelihood once the road is constructed, but only 600 families from Worli have joined the fight to oppose the road and save their way of life.

"There is a misconception that the road will be built on stilts," explains Fernandes, "but that is not the case. It will be built entirely on reclaimed land."

Work on the project will be taken up in two phases. The stretch from the Princess Street flyover to the Bandra-Worli Sea Link (South) comprises the first phase while the second will go from Bandra to Kandivali. The eight-lane expressway was estimated to cost ₹222 crore per km in 2011. Eight years later the cost has increased by seven times and those opposed to it say that the benefits are not clearly stated.

A 27-page report put together by Fernandes details several coastal violations and shows that the BMC had only one stakeholder in mind when planning the project — private vehicle owners, even

though one lane on either side is expected to be reserved for bus transport.

According to the report, the road falls within Coastal Regulation Zone (CRZ) 1B, CRZ II, CRZ III and CRZ IV A, provisions enacted for protection of the coastal environment. One of the provisions in the environment clearance given by the Ministry of Environment, Forest and Climate Change, states that project activity shall be carried out in accordance with provisions of CRZ notifications (2011) and shall render the coastal ecology of the area, including flora and fauna, to its original state after completion of the project.

Coastal activists like Fernandes question how this is possible when the entire project is going to be built on reclaimed land. Her report claims that 340 marine inter-tidal species have been identified on the shores of Mumbai, all of which are under threat. "The intertidal environment, the zone between the high and low water, across the world supports a rich and unique biota consisting almost entirely of marine organisms," the report states.

At present a stay order has been issued by the Bombay High Court which recently finished hearing eight petitions, one of which was filed by Vanashakti, the NGO with which Fernandes is associated. "The crux of the matter is — can the road be constructed without reclamation and,



Sarita Fernandes



Marine life is at risk

Juhu, Cuffe Parade and other areas have not joined the opposition to the project. The fishing settlement at Worli is the only one to take up cudgels against the road.

Members of the Worli community can be classified into three categories: First, fishermen fishing within the rocky shores without boats. Second, those using mechanised boats up to four nautical miles and then the fishermen fishing beyond four nautical miles.

"Once this road is constructed the intertidal space will disappear and all fishing communities dependent on it will lose their livelihood," explained Fernandes. "The community at Worli is artisanal which means they are completely dependent on fishing in the intertidal zone. They were offered compensation, but rejected it on the basis of the inter-generational clause which ensures livelihood protection for future generations."

The driving argument behind the project is ease of travel. According to the environment clearance, the road will reduce commuting time by 70 percent and fuel saving per day will be 34 percent.

Statistics show that in 1998 Greater Mumbai and Thane had 13.32 lakh three-wheelers, four-wheelers and more, and in 2017 this figure reached 65.26 lakh. Similarly, in 1998 there were 5.98 lakh two-wheelers which increased to 39.01 lakh in 2017. On an average, 700 new vehicles hit Mumbai roads every day.

However, Fernandes is not convinced. Her report states that the coastal road would benefit only 10.9 percent of the commuting population. "The metro project that aims at decongestion will alleviate pressure from BEST traffic. Local railways also contradict the need for a ₹15,000-crore coastal road," her report states.

According to the detailed project report (DPR), only cars are expected to be diverted along the coastal road, which means public funds are being spent to augment private travel. It further states that due to abutting land use and limited access to the facility, the growth rate (two percent) will be lower along this proposed road, while traffic along existing roads will grow at 5.5 percent per annum.

The DPR estimates that by 2043, traffic along existing routes will nearly double to approximately a lakh cars and nearly half of these will be diverted to the coastal road. Also, in order to move more traffic along the coastal route it is proposed to make it toll-free which goes against the user-must-pay principle.

However, not everyone buys this. For instance, the Bandra-Worli Sea Link is instructive in this regard. It was initially estimated to cost ₹300 crore and handle 100,000 cars a day. It ended up costing ₹1,600 crore and its average daily ridership stands at 32,312 cars.

Fernandes argues, "The figures and projections are vague and by building more roads, the government is encouraging use of private cars over public transport. Decongestion can only be achieved through public transport which needs to be strengthened. This coastal road is fancy, elitist and gross mismanagement of public funds." ■

# Ludhiana's toxic nightmare

Raj Machhan  
Chandigarh

**A**N aggrieved and highly agitated group of citizens in Ludhiana has hit the hot, dusty streets of this industrial city to seek protection of their right to life.

"Enough is enough. This time it will be a fight to the finish," says Gurpreet Singh Chandbaja, a leader of the Naroa Punjab Manch (NPM) and president of Bhai Kanhaiyaji Cancer Prevention Society.

The NPM is an initiative by citizens from Ludhiana and the scores of villages that lie on the banks of the Sutlej river in Malwa region of Punjab.

"For the past 40 years, the poison spewed by the Buddha Nullah has brought death and disease to our people. They are dying of cancer. Our crop yields have reduced and our livestock develop maladies that even the vets are unable to identify," he says.

Ludhiana is the business capital of Punjab and figures among India's top 10 cities with the maximum number of high-end vehicles such as Mercedes, BMW, Jaguar and Range Rover cars. It is Punjab's largest city and contributes the most to the state's Gross Domestic Product (GDP). The Ludhiana Municipal Corporation has the biggest budgets — ₹1,200 crore in 2018 — among all cities in Punjab.

The Buddha Nullah, earlier known as Buddha Dariya, is a tributary of the Sutlej. It separates from the river near Koom Kalan village and rejoins it downstream after flowing through Ludhiana for 15 kilometres.

"Successive governments have failed to protect our Right to Life as per Article 21 of our Constitution, which is the very basis of any society. Despite the fact that everyone is aware of the serious nature of the problem, no civic body or government department has come forward to do anything," says Chandbaja.

According to a 2015 Punjab government study, Muktsar district has 136 cancer patients per 100,000 of population, while the average in the entire Malwa region stands at 107 patients per 100,000. The national average is 96 per 100,000 (Ernst & Young, 2015).

The incidence of cancer and infectious diseases is the highest among people living along the banks of the polluted Sutlej after the highly toxic Buddha Nullah discharges into the river the poisons it collects after flowing through Ludhiana.

Says senior Punjabi poet and writer Jasveer Singh Bhalooria, "Though I had heard of the *nullah*, I had never seen it. I thought of Ludhiana as a city that brought glory to Punjab and even penned a long poem in its praise."

Bhalooria's impression about the city changed drastically after he witnessed a citizens' protest march convened by Chandbaja near Walipur Kalan village, where the *nullah* rejoins the Sutlej. The

protesters were mainly from villages downstream. They had got together to pressure the authorities into finding a permanent solution to the dirty *nullah*.

Bhalooria puts it this way: "I saw shock in the eyes of the people who were seeing that river from hell for the first time. The hell that we visualise after death was in front of us for real. Thick wafts of putrid air attacked our sense of smell and, after a period of time, we just couldn't smell anything."

Jaskirat Singh, a leading activist of the movement, says, "The water was black, thick with every kind of pollutant. We could make out chemical waste, untreated waste from factories, mainly electroplating units and dyeing units, untreated



The filthy Buddha Nullah spreads infectious diseases and cancer along its route

sewerage and the worst muck that one can imagine."

The participants in the protest march decided to take the matter into their own hands. For 40 years they have seen people falling prey to the worst diseases, their neighbours getting physically deformed and ultimately dying of cancerous growth in all parts of their bodies.

Deadly carcinogens enter the food chain through water absorbed by crops and vegetables grown on the banks of the river, thereby spreading disease and death further into the hinterland. The groundwater along the river and its canals was found to also contain high quantities of arsenic and uranium.

A study done by the Punjab Agriculture University (PAU) in 2006 had pinpointed this state of affairs. "But the government tried to hush up the findings at that time," said a social activist on condition of anonymity.

In their collective wisdom government officials then decided to cut off the *nullah* from the Sutlej by creating mud dams near Koom Kalan village where it separates from the river. So by the time the *nullah* crossed Khasi Khurd village, its bed was totally dry. No fresh water flowed into it. The *nullah* assumes its present form while flowing through the city.

For a city of over two million people (as per

growth projections based on the 2011 census), the Municipal Corporation has only three sewerage treatment plants with a total capacity of 311 MLD against a requirement of 750 MLD. What is worse, these plants do not even function at full capacity. The Municipal Corporation has been directly dumping raw, untreated sewerage into the *nullah*. Add to this the regular discharge of mostly untreated industrial effluents and the *nullah* turns into a cocktail of pollutants.

As per the PAU study, industrial effluents discharged directly into the *nullah* increased the concentration of metals multiple times in its 15-km journey through the city. For example, the mean content of chromium, nickel, arsenic and lead increased by 260, 140, 42 and 19 times, respectively, along with very high levels of COD (Chemical Oxygen Demand) and BOD (Biochemical Oxygen Demand).

The study revealed a high concentration of deadly microbes such as E.coli, Shigella, Vibrio, Salmonella, Enterococcus, Klebsiella, Proteus and Pseudomonas, indicating pollution from human and animal faecal matter. What is worse, water samples from hand pumps and submersible pumps along the Buddha Nullah downstream at Haibowal, a locality in Ludhiana city, were found to be heavily contaminated.

Residents of Ludhiana depend mainly on groundwater. The PAU report presented a damning picture of the quality of water being consumed by individuals (mostly the weaker sections and industrial labour) from hand pumps within 200 metres of the banks of the *nullah* on either side. The water contained metals like lead, chromium, cadmium and nickel.

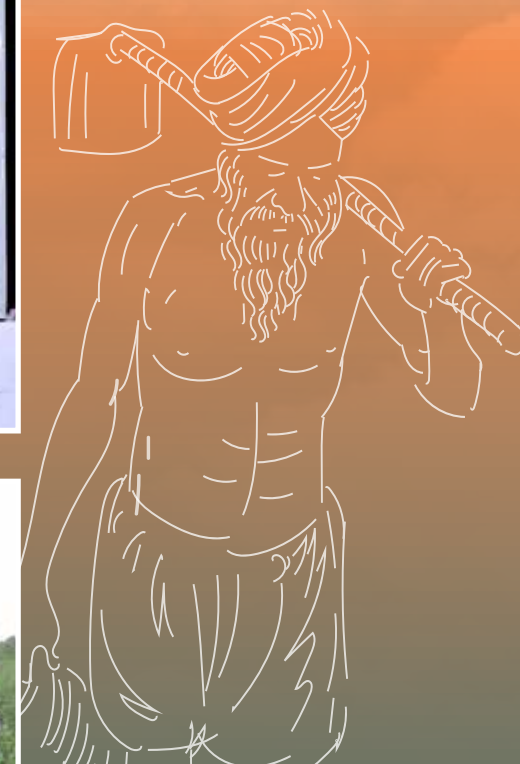
As per the report, the poisonous drain has led to contamination of soil, crops, and whatever vegetation exists on the banks of the Sutlej right across the Malwa region up to the border districts of Rajasthan. The bacterial count in the Sutlej increased 10,000 times three kilometres downstream from its confluence with the deadly drain.

Of late, the matter has been taken up by the National Green Tribunal (NGT), which has directed the Punjab Pradesh Pollution Control Board (PPCB) and other related departments to come up with a permanent solution, instead of wasting ₹2 crore and more every year on 'temporary' cleaning.

A delegation of the Naroa Punjab Manch along with the Tapvan Trust from Rajasthan — the river water affects nine Rajasthan districts which border Punjab — met Union Minister of Jal Shakti Gajendra Singh Chauhan on June 20. Among other measures, they have demanded completion of Common Effluent Treatment Plants (CETP) and upgradation of Sewage Treatment Plants (STPs). The minister has assured all help to them — like many others in the past. ■

## Contract Farming with NAAM Foundation

Himalaya is supporting the empowerment of marginalized farmers in the Marathwada and Vidarbha regions of Maharashtra. We have collaborated with NAAM Foundation to help farmers in these regions through contract farming and herb cultivation. Himalaya is creating a cost-effective system by providing free seeds, packaging materials, and transportation. Through this initiative, we are helping farmers achieve financial stability by buying back the herbs at a predetermined price. Our cycle of engagement helps eliminate market price fluctuations and dependence on intermediaries by bringing the assurance of an ensured buyer and a fair price.



# To keep girls safe Delhi colleges get their act together

Sidika Sehgal  
New Delhi

LAST year, when girl students of Gargi College, Kamala Nehru College and Jija Bai Industrial Training Institute for Women on Delhi University's South Campus complained of being harassed in buses, the principals of the three colleges got together to seek a solution.

They called a meeting with the local MLA, an official from the Delhi Transport Corporation (DTC) and an official from the DMRC (Delhi Metro Rail Corporation) to discuss what could be done. Through their collaborative effort, bus no. 544 now plies exclusively for women at 8.30 am and 4.45 pm on weekdays.

Also, every year, Gargi College's National Sports Organisation conducts a self-defence workshop for first-year students, sometimes in collaboration with the Delhi Police. The objective is to empower women to protect themselves.

"You have to have the courage to fight back," says Dr Promila Kumar, principal of Gargi College.

New Delhi is infamous for crimes against women but colleges are now taking proactive steps to safeguard their students inside and outside their campuses.

They have taken an order by the University Grants Commission (UGC) on sexual harassment with extreme seriousness. On May 2, 2016, the UGC made it mandatory for every college and university to have an Internal Complaints Committee (ICC) to address sexual harassment of women employees and students in higher educational institutions.

The order underlined the fact that women's safety is not just a women's issue. The State and its institutions are fully responsible.

**AT GROUND LEVEL:** Kamala Nehru College doesn't have a hostel for its students. So the students live in paying guest (PG) accommodation in nearby colonies like Gautam Nagar, Sadiq Nagar, East of Kailash and Malviya Nagar. The college has set up a Proctorial Committee of male and female faculty members which patrol all these areas.

Dr Kalpana Bhakuni, principal of Kamala Nehru College, said that they have ample space on their campus to construct a hostel. But because of the proximity to the ruins of Siri Fort, a historical area, they cannot undertake any construction. The Proctorial Committee makes sure that the area is safe and that students don't face difficulties while walking back from college.

"Young people don't report sexual harassment

because they feel judged," said Dr Bijayalakshmi Nanda, the acting principal of Miranda House. She realised that students may be hesitant to talk about sexual harassment with people they don't know. To tackle this, along with the ICC, Miranda House has constituted a Gender Sensitisation Committee (GSC), which has a representative from each class.

If a student doesn't feel comfortable talking to the ICC representative, she can report the incident to the GSC representative who then takes it up with the ICC. The effort is to change attitudes associated with sexual harassment and thereby de-stigmatise it. All complaints are taken very seriously.

How far would the ICC go to punish the accused? "We can ban their entry into the college and we



Dr Bijayalakshmi Nanda, Acting Principal, Miranda House

have done so in the past," says Dr Vibha Singh Chauhan, principal of Kirori Mal College. The order is extremely well-crafted — it has checks and balances for misuse as well.

College girls often get harassed on the street by men on bikes or in cars. In such a situation, filing a complaint is not an option because there's no way of knowing who the man or men were. But talking about these incidents is cathartic.

Miranda House has started a peer mentorship programme for such conversations. Dr Nanda says that collectives, especially of women, can be very powerful. She cited the case of a student who went through a divorce while she was studying at Miranda House. The student required no emotional support from her family because her friends stood solidly by her every step of the way.

Students often talk about harassment by family members and Dr Bhakuni understands how sensitive such conversations could be. When



Students at Miranda House



Girls take a ride on an e-rickshaw on North Campus

students bring these experiences to college, the college must do whatever it can to empower the students, she says. Kamala Nehru College, for instance, has a counsellor who students can talk to and seek advice from.

**TALK AND LISTEN:** CCTV cameras, police patrol cars outside colleges and better lighting in the area help the cause of safety. But larger solutions, which get to the root of the problem, are also needed.

"Awareness is the key," said Dr Monika Koul, NSS Program Officer of Hansraj College. Every year, Hansraj College conducts a seminar, once for their students and once for their non-teaching staff, to talk about what comes under the purview of sexual harassment.

An orientation session to sensitise students about what constitutes harassment is the norm in most colleges. Dr Chauhan pointed out that students come from diverse backgrounds and may not have

PICTURES BY SHREY GUPTA



Posters by students on sexual harassment at Kamala Nehru College



Dr Kalpana Bhakuni, Principal, Kamala Nehru College

had exposure to conversations on sexual harassment. Therefore these conversations are important. No one is born with a perfect understanding of what's acceptable and what's not. "Women have to be made aware of their rights and men have to be made aware of the limits of their

rights. Even a call from a boy at 2 am can count as harassment, if it is an unsolicited call," pointed out Dr Chauhan.

Gender sensitisation programmes seek to correct notions that girls are brainwashed into believing. Dr Charu Dogra Rawat, the convener of the Ramjas College's Women's Development Cell, cited the case of a female student who was in an abusive relationship and didn't even realise it until her friends pointed it out to her. She hoped that both boys and girls would become volunteers of WDC in the coming year because patriarchal ideas influence boys too.

At Miranda House, the Women's Development Cell invites police officers for gender sensitisation seminars. Dr Nanda believes that if their attitudes towards women's safety change, they will become more approachable for girl students.

The recent proposal by the AAP government to make the Metro free for women has opened up a discussion on the politics of public spaces. Free Metro or not, the conversation about how to make our cities safer for women is not for feminists or for women alone. It must include all citizens, especially policymakers and those who plan our cities. ■

## Samita's World

by SAMITA RATHOR

I DON'T APPRECIATE WHAT I HAVE,  
THE SAME REASON YOU DON'T  
APPRECIATE WHAT I SHOULD HAVE!



SAMITA

# ‘WE WILL BRING WATER BODIES BACK’

Ankit Srivastava on Delhi’s plan for tanks, lakes

Rwit Ghosh  
New Delhi

IN days gone by Delhi used to be dotted with water bodies. Many have disappeared under roads and buildings and the ones that remain are just sad relics filled with garbage and sewage. Meanwhile, groundwater levels in the city plummet as citizens continue to bore deeper for water.

The Aam Aadmi Party (AAP) government in Delhi has now launched an ambitious plan to improve groundwater levels by reviving defunct water bodies and constructing lakes to harvest water. An initial pilot project in Rajokri by the Delhi Jal Board (DJB) is going to be the template for this rejuvenation. Rajokri, on the Delhi-Gurgaon border, had a pond filled with sewage from an unauthorised colony adjacent to it. The DJB cleaned it up, put in a sewage treatment plant, constructed a wetland and landscaped the area. Local residents were thrilled. The ecological benefits from the project are likely to be considerable. One offshoot could be a cleaner Yamuna.

Ankit Srivastava, technical adviser with the DJB, spoke to *Civil Society* about their plans for water bodies.

**How many water bodies is the DJB planning to revive?**

The DJB is working on 159 water bodies and the Irrigation and Flood Control Department is working on 95. We are also creating six large new lakes from flat land. Additionally, the DJB will also be working on nine lakes and 10 water bodies owned by the Delhi Development Authority (DDA).

**What is DJB’s plan?**

In Delhi we have three kinds of water bodies and



Ankit Srivastava: ‘Customisation for each water body and lake revival is required’

lakes — those which are dry, those which are contaminated with sewage, and those which have mildly contaminated rainwater.

Based on water quality, topography, location — whether the water body is in a rural area, urban area, urban village or in an unauthorised colony — as well as the source of water, rejuvenation plans are drawn up. A customised plan is made largely for the arrangement of water for the water body.

In our definition, a water body needs to be filled with water throughout the year. It should not be a civil engineering exercise where you construct a wall around the water body and wait for rain to fall into it.

In our case, we are focusing more on using treated sewage as a source of water for water bodies as it is the only perennial source of water in Delhi. It rains only 15 or 16 days annually and the pattern of rain, especially its intensity, has changed. We get 600 mm of rain. But you will get 100 mm of rainfall in an hour or within a day. That is one-fifth of your rainfall quota.

Much of that water spills onto roads. Even if it falls into water bodies, it is too much to handle. The water will overflow from the water body.

Considering all these constraints, there is no general solution for rejuvenation. That is why customisation for each water body and lake revival is required. Typically, 80 to 90 percent of water bodies in any city are contaminated with sewage. We are creating a small Sewage Treatment Plant (STP) for the colony adjoining the water body. This will also push us into setting up a sewage

management system in that area. The STP will act as a source of water for the water body.

We will polish the water enough so that it can go underground into the water table. We are also creating rainwater harvesting structures and recharge pits in areas adjoining water bodies so that rainwater plus any overflow that happens down the line can go into the recharge pit and percolate into the ground.

Secondly, we are removing the historical waste in water bodies. That is a major reason why percolation is not happening. In this way, the water body will have water throughout the year.

The third component is that every water body has certain flora and fauna associated with it. We have included the cost of environment conservation in all our budgets so we can replant native species.

Lastly, social ownership. We are creating green spaces and putting up benches, open gyms and, wherever there is space, amphitheatres and a Chhath ghat to connect people to the water body.

At the Timarpur lake, we have made provisions for medicinal plants, a butterfly park, an amphitheatre, a small refreshment centre and so on.

We also have certain set-ups where creating STPs is not feasible. In such cases, we will be bringing water from the nearest STP. The DJB has 36 big STPs where we already have cleaned water as part of the Yamuna Action Plan and the Ganga Action Plan. This water will be brought through a pipeline.

Some guidelines are still open-ended, like what kind of water should be put into the water bodies

when you are bringing in treated sewage. We are going a step further and putting in an additional polishing pond. We will double check to ensure no contaminated water goes into the water body.

The main purpose remains groundwater recharge. Our definition of water body rejuvenation will be different from what the NBCC (National Buildings Construction Corporation) has done in old Delhi. They have put in a liner and filled up a water body with water. It’s more of a swimming pool because there is no percolation of water. We won’t go down that path. We will be taking the environmental route.

**How much water do you think will percolate from these water bodies and lakes?**

Historically, there are variable rates of percolation within Delhi. The Yamuna floodplain area, for example, has sand beds up to 40 to 50 metres. Sand beds have a very high percolation rate. In those areas, you have percolation rates of nine to 10 metres a day.

Then you have areas like Sangam Vihar, which are on hilly terrain with hard rock beneath the soil. There are no thumb rules here. Percolation would be based on the cracks. We have all sorts of percolation rates in Delhi from one mm to nine metres per day. But since our main focus is on groundwater recharge, we have been creating harvesting pits.

Right now, we are targeting percolation rates of 15 percent to 40 percent. If there is natural

percolation, it is beneficial for us. Where there isn’t, we will be making harvesting pits with precaution so that we can maintain the percolation rate and there is no contamination.

**How much water will be captured in these water bodies?**

On an average, these 255 water bodies are between 0.5 acre to 1.5 acres. A one-acre water body with a depth of one metre has the capacity to hold almost one million gallons of water. Right now, we’re calculating on the basis of a depth of one metre or three feet because we don’t want anyone to drown in it.

So one million gallons of water with a 15 percent rate of percolation works out to 680,000 litres of water per day per water body. Multiply that with 255 water bodies. The capacity of lakes, however, is huge. For example, one lake in Rohini is able to hold 30 million gallons of water. So 15 percent of that is a huge amount. Similarly, the lake in Dwarka will be able to hold 33 million gallons of water.

So from six new lakes, about 30 million gallons of water will percolate to the underground water table, maybe a little more. From the smaller water bodies which number around 255, around 40 million gallons of water will percolate. Roughly, it will come to about 80 million gallons. This is about the same

**‘In our definition a water body needs to be filled with water throughout the year. It should not be a civil engineering exercise where you construct a wall around a water body and wait for rain to fall into it.’**

amount of water that the DJB pulls out of the ground.

**Water bodies come under the jurisdiction of a multiplicity of agencies — the DDA, the three Municipal Corporations, the Archaeological Survey of India, the forest department. Are they keen on handing them over to the DJB for revival?** Irrespective of the landowning agency, the beneficiaries will be the population of Delhi. We took approval from the chief minister. On that basis, we requested the DDA to give us permission to rejuvenate their lakes. DDA has given us an NOC (No Objection Certificate) on condition that the DJB will pay for rejuvenation.

Other agencies tell us that they don’t have the expertise to revive water bodies. We have volunteered to provide them technical expertise. But, largely, the response has not been very good. Meanwhile, we have taken over nine major lakes from the DDA, including the lake at Bhalaswa, which is 150 acres and has the capacity to hold 150 million gallons. Fifteen percent of percolation from that lake would be around 22.5 MGD.

If you rejuvenate all small water bodies you will save about 35 MGD. Then you have a lake at Tikri Khurd which is 70 acres and Sanjay Lake in east Delhi. Reviving Sanjay Lake will vastly improve water supply in east Delhi. The groundwater there has been severely depleted and has a high amount of TDS (totally dissolved solids).

I don’t know how much the other departments are doing. I understand the DDA is trying. In fact,

these 155 water bodies we are rejuvenating don’t come under us. They belong to the Revenue Department. We do have an ample budget, but we can’t take over all the water bodies.

**How do you deal with encroachments?**

At the Rajokri site we faced this problem. Three or four slum dwellers were a real hindrance. They would throw stones at our contractors while they were working. Besides, such settlements are also a source of pollution. They have cows and buffaloes, which produce dung. We have written to the appropriate departments to remove encroachments but we are not going to let that stop us. We are redesigning the STP and the architectural part and assuming that the encroachment will remain.

If four or five households are encroaching on the land and putting sewage into the water, we will place intercepting lines, which go to our STP. So their sewage is still diverted to us. We are also including operational and maintenance costs in our budget.

**Have you talked to resident welfare associations (RWAs)?**

Yes. In Rajokri, our original plan did not have any provision for a Chhath ghat. We got inputs from the

RWA and nearby communities who celebrate Chhath Puja, that they want a small bifurcation of the water body exclusively for their religious activities. We constructed a small, natural wall in the water body. It cost us around ₹20 to 30 lakh but we ensured their inputs were included. Now they maintain it. Of course, the government is doing its part. But once the water body was completed, the people took responsibility for its maintenance as well.

**Some water bodies have historical significance. Do you plan to revive their legacy with the ASI or maybe another organisation?**

Right now, we have not thought in that direction. Restoring archaeological sites requires a different sort of expertise, which is not available with the DJB currently. We have divided our work into different components — water conservation, beautification and community engagement.

The ASI is a very specialised agency. INTACH (Indian National Trust for Art and Cultural Heritage) and the Aga Khan Trust have done such work in Humayun’s Tomb. But actually we have only four or five water bodies of historical significance. It is only two to five percent of the work. If the Delhi government’s archaeological department takes it up, we can easily get approval. The chief minister, who is also the chairman of the DJB, proposed that we rejuvenate *baolis* as well. Within the Delhi government, no extra permissions are required.

*Continued on page 16*



## 'We will bring water bodies back'

Continued from page 15

Satpula is a DDA lake. We took an NOC from the ASI for the lake, not the park. The monument ends at the beginning of the water body. There is a very clear-cut boundary. In the case of Hauz Khas, which also has a DDA lake, there is a monument adjacent to it. We had to change treatment mechanisms a bit because it was falling in the 100-metre boundary of the monument. Hauz Khas had waste from unauthorised colonies coming in. That water body is actually fed by the DJB's STP.

### Does Delhi need stricter laws to protect urban water bodies?

I think we have sufficient laws. The issue is enforcement. Out of 1,200 unauthorised colonies which dump sewage into water bodies, 400 have sewer lines while work is going on in another 400. It takes time because sewer lines are eight to 10 feet deep. The rest don't even have sewer lines.

## 'In Delhi for so many years money was spent on laying pipelines. But sewer lines have to be connected to homes.'

Civic facilities need to be provided. It was part of AAP's manifesto. The first thing the CM did after coming to power was to promote decentralised STPs so that all the colonies could be covered immediately. So you treat sewage where it is created instead of putting it into kilometres of pipelines. This water body rejuvenation project is a combination of both. It is a challenge.

In Delhi for the past so many years money was spent on laying pipelines. Politically it looks good — they can say we have placed sewer lines. But lines have to be connected to households.

Take East Delhi. Sewerage coverage on paper is 100 percent. There are perhaps 2.5 million households in East Delhi. Every household has a sewer line in front of it. Despite that you have so many small drains going into bigger nullahs and then into the Yamuna. This is because households are not connected to the sewer lines. And this is not just the problem of unauthorised colonies, authorised colonies have the same problem.

So in 2017 the DJB approved a plan to connect all households to sewer lines. Again, because of the political scenario, that plan is pending. Once it is approved it will be implemented. The deficit of unavailability of sewer lines in the colonies will be catered to.

### What about land sharks?

Yes, land sharks are there and political connivance as well. If we are able to revive a water body, it will be difficult for them to encroach because water levels will increase in the adjacent areas. So even if they want to build a civil structure, the water levels will not permit it. ■



Sagar Gokhale and Ameya Kulkarni founded Ojman Foodbio which makes and sells sol kadi in hygienic cartons

# Kokum booming and sol kadi is the winner

Shree Padre  
Kasaragod

**K**OKUM (*Garcinia indica*), an indigenous fruit with medicinal value, is becoming the nub of a rising beverage industry in the Konkan region of Maharashtra with two drinks, *sol kadi* and kokum squash, rapidly gaining popularity.

Every year, about 10,000 litres of ready-to-serve *sol kadi* are sold in Pune and Mumbai. These are modest estimates. In the Konkan region as a whole, about 20,000 litres are sold. The *sol kadi* business alone is estimated to be around ₹60 crore a year.

*Sol kadi* is made from kokum and coconut milk. Salt and spices like cumin, chilli and garlic are added. The squash is like any other. It is *sol kadi* that is traditionally consumed with meals in the Konkan and while its popularity has spread to Mumbai and Pune, it is unknown in other kokum-growing areas in the districts of Uttara Kannada and Dakshina Kannada.

Innumerable households in the Konkan region make kokum squash and *sol kadi*. In towns like Ratnagiri and Kudal it is said if you throw a stone it will hit a kokum unit! But many small units sell unbranded products and their packaging is unprofessional.

Taking *sol kadi* to a different level altogether is Ojman Foodbio, a company which started manufacturing *sol kadi* in 2017. It sells the drink in attractive cartons, similar to soft drinks. Ojman *sol kadi* even sells on e-commerce giant Amazon.

Sagar Gokhale, co-founder of Ojman Foodbio and a PhD in food processing, says the *sol kadi* business has steadily increased in the past 10 years.

Currently, there are about 10 big players and around 100 microenterprises spread over Pune, Mumbai and Konkan selling *sol kadi*.

**SMALL, SMART UNITS:** Lalitha Khaire of Pune makes kokum squash under the brand name, Kokanraja. Her enterprise is called Pushpak Food Products. She claims that she was the first to set up a kokum unit, and that she sells 400,000 litres of kokum squash annually, making her the biggest producer of kokum squash.

"People in Pune are very health-conscious. They drink a lot of *sol kadi*," says Khaire. She sells *sol kadi* in 200-ml pouches, priced at ₹20 each. On average, she sells 500 pouches or 100 litres.

Khaire's *sol kadi* is sold to hotels, but her kokum squash is sold at shopping malls where she provides a 'buy one, get one free' offer. The enterprising Khaire is planning to bottle her *sol kadi* and is working on a design.

"Pouches are not suitable for modern trade. It is the middle and upper class who shop at malls. We are carrying out R&D so that our products get a longer shelf life and I can sell 5,000 bottles, that is, 1,000 litres a day," she says, confidently.

Her *sol kadi*, priced at ₹20 per pouch, has a shelf life of 30 days, says Khaire. She has experimented with PET bottles and plans to sell each bottle for ₹30 with a shelf life of six months.

Kokum squash is popular in summer but *sol kadi* sells through the year. In summer, demand for the drink rises. It is considered a mandatory drink after a meal, good for digestion. In Konkan homes, *sol kadi* is generally made fresh every day.

But it doesn't have much of a shelf life. Coconut



Saurabh Shengde sells sol kadi under the brand name Sharad



A cool glass of sol kadi

milk without preservatives turns rancid. Kokum agal, a concentrate mixed with salt, is also available. It has to be mixed with freshly extracted coconut milk.

*Sol kadi* has also become an essential item on the menu in hotels that serve Konkani cuisine. Since coconut milk is an expensive ingredient, a 200-ml glass of *sol kadi* costs ₹20-25.

Abhijit Salvi runs Hotel Shuddha Shanth at Khed in Ratnagiri district. For the past two years, he has been making *sol kadi* after being trained by his father. The *sol kadi* they make is kept ready in one- and five-litre cans. A one-litre can is priced at ₹250, whereas five litres costs ₹700. You can also buy a 200-ml glass of *sol kadi* priced at ₹35 at their hotel.

Salvi used to make, on an average, 15 to 25 litres a day. Over the years, demand has risen, especially in



Lalitha Khaire with her brand of Kokum Sarbat

summer. "During the warm season 100 litres gets finished in two days. Our main customers are travellers who buy cans of *sol kadi*," he says.

According to Salvi, his *sol kadi* has a shelf life of only three days at room temperature. In a refrigerator it lasts for 10 days. If coriander leaves are added, the *sol kadi* lasts just a day.

Salvi supplies *sol kadi* to a few hotels in Khed who place their orders in advance. "We have made *sol kadi* a habit for people. It has turned into an anytime drink. Most customers drink it as a digestive," says Salvi.

Saurabh Shengde has been running a family enterprise selling *sol kadi* under the brand name of Sharad since 2010. His small manufacturing unit, started by his parents, is now manned by his entire family. Shengde, a computer engineer, left his job to

return home and improve the business. He has been boosting production and marketing since 2012.

The Shengde family has put together a simple low-cost machine that makes *sol kadi* which is sold in 200-ml pouches priced at ₹30 and one-litre packs that cost ₹150 each. In summer, their average sales are around 3,000 to 5,000 pouches per day. Sharad *sol kadi* has a shelf life of 15 days, if refrigerated. At room temperature it lasts only three days.

Shengde's main clients are hotels and restaurants in Pune and customers in Satara and Nashik. Pune has around 6,000 restaurants and Shengde's *sol kadi* is bought by 300 to 400 of them.

Apart from sweet shops, ice-cream parlours and Neera parlours, the youth are also consuming *sol kadi*. "New-gen users like it for its medicinal value and also because it is an Indian traditional drink made with natural ingredients. They stop their cars and scooters near Neera parlours to pick up *sol kadi* pouches," explains Shengde.

**SOL KADI REINVENTED:** Gokhale, who founded Ojman Foodbio with Ameya Kulkarni, recalls, "One of the problems we faced while making *sol kadi* was that its two components, coconut milk and water, would separate into two layers after 15 minutes of mixing. We spent three months solving this problem."

A 250-ml pack of Ojman's *sol kadi* costs ₹30 and has a shelf life of six months. "We sell about 10,000 pouches a year. The market is slowly picking up," says Gokhale. Through Amazon, Ojman's *sol kadi* is sold all over India. But the two cities that have shown the most interest in *sol kadi* are New Delhi and Hyderabad, according to Gokhale.

"Maybe people there sampled *sol kadi* elsewhere and wanted to try it at home," he says. Test marketing by his company in Mumbai and Pune showed that non-Maharashtrians really liked the drink. He believes that *sol kadi*'s prospects are bright outside its traditional consumer base.

In fact, Ojman even exported small consignments to the US and UK two or three times. The response was good. But due to some drawback in the packaging they had to suspend exports. They plan to resume after improving their cartons.

"There are many sweet beverages in the market. But *sol kadi* is a combination of tastes — sweet, salty and spicy. Maybe the salt and spice needs to be toned down for non-Maharashtrian taste buds," reckons Gokhale.

What property would he highlight to sell *sol kadi* to new consumers? Would it be taste or medicinal qualities? "Nobody has a soft drink for medicinal purposes. Taste is the only criterion. Of course, medicinal properties are an added bonus. Also, it's a natural drink made with the goodness of kokum and coconut," says Gokhale.

Advertising *sol kadi*, providing samples to consumers and creating a supply chain are some of the challenges which a company like Ojman would face.

Another concern is maintaining quality. Sources in Konkan point out that to cut production cost, some entrepreneurs use buttermilk instead of coconut milk. Also, to add colour to *sol kadi*, beetroot juice is being added.

Despite these glitches, the future of the *sol kadi* business looks promising. It is the newest entry into the range of healthy and 'cool' Indian drinks. ■

# Gargi and Ajay fight for clean air in Kolkata

Subir Roy  
Kolkata

AIR quality in Kolkata deteriorates severely every winter and during the last one it was the worst among all the metro cities in the country. The city not only overshoot the prescribed air quality index of 50 through an entire year (May to April 2018-19), during half the year from October to March, it went above 150 and touched a peak of over 300 in December-January.

This is the demon that the fledgling voluntary organisation, Kolkata Clean Air, has taken on. It was started two years ago and is headed by Ajay Mittal and Gargi Maitra. Mittal, who comes from a business family, has decided to branch out on his own, offering business development consultancy to information technology firms. Maitra, whose expertise has been in health related work, is the programme lead.

The first step in addressing a problem is to get people in important positions to acknowledge that there is a problem. Kolkata Clean Air feels there has been some progress on this. In the run-up to the parliamentary elections, Sabuj Mancha, an NGO, brought together stakeholders in a meeting on pollution in which some political leaders participated.

The Trinamool Congress, which matters in West Bengal, in its manifesto said that it is "deeply committed to a clean and green environment" and, pointing to the exponential rise of automobiles in the country, said laws relating to automobiles need changing. In fact, the environment gets mentioned in the manifestoes of all leading parties but unfortunately, says Mittal, no action agenda has been outlined on this in the Union Budget.

Mala Roy, the Trinamool Congress candidate who went on to win from the prestigious South Kolkata constituency, said during the campaign that "the city needs green cover to combat air pollution". She has earned some distinction in this regard. As a municipal councillor, her ward, no. 88, has been judged the cleanest by the Kolkata Municipal Corporation.

The second need to wage a systematic war on a social issue is to prepare a baseline scenario. It tells us where we are and this gives a marker to chart the journey ahead. A health camp conducted with Narayana Hospitals and the police of Bidhannagar, a posh new suburb of the city, has this to say. Seventeen percent of traffic constables and civic volunteers who spend hours breathing the air above city roads, were detected with abnormal pulmonary function, though 60 percent of those found abnormal were non-smokers. And all those tested were not that old — their average age being 30.

"These results are very worrying and urge policymakers and citizens of Kolkata to take urgent action to reduce air pollution," says Dr Sugato Roy Chowdhury of Narayana Superspeciality Hospitals. Kolkata is the lung cancer capital of India and as many as 70 percent of its residents suffer from respiratory disorders.

Who is responsible for this? Private cars and taxis foremost, reveals a congestion mapping study. Their share of vehicular traffic in the city has gone up rapidly by 5 percent in five years to reach 57 percent in 2018. The city is also primarily diesel-driven, with 65 percent of new cars being diesel-powered.

Another trouble area is solid waste disposal. People continue to indiscriminately burn garbage, prompting the police to issue a fresh notification recently saying this is illegal. Plus, methane gas emissions from the city's primary landfill at Dhapa gets fired on its own, posing a major hazard.

Kolkata Clean Air has networked over a hundred organisations and institutions and through this, thousands of citizens. Its aim is to make Kolkata one of the most livable and pollution-free cities through community projects, policy advocacy and behaviour change.

In the past two years Kolkata Clean Air has held clean air leadership workshops with over 400 school and college students, over 800 have participated in marches



Gargi Maitra and Ajay Mittal measuring air pollution on a Kolkata street



**A citizen-centric air quality network of five stations monitors levels of pollutants.**

and rallies and over 20,000 signatures have been collected. It has also held a stakeholders workshop in which government and academia have participated. Another key initiative is to have created a "Doctors for clean air" forum which 22 leading city doctors have joined. Plus eight vertical workshops on composting and gardening have been organised.

Another key initiative has been to create a citizen-centric air quality monitoring network of five monitoring stations to measure the presence of particulate matter in the air across the city. The monitors have been provided by a Delhi-based organisation, Urban Sciences. To take this forward, Kolkata Clean Air plans to get in touch with corporates.

The distance to be covered is daunting. One arm of the law has not kept pace with another. Since April 2017, diesel vehicles can be sold only if they have BS4 specifications. Even this will have to give way to BS5 from April 2020. But Mittal says an expert told Kolkata Clean Air that the pollution checking centres in the city have not yet been recalibrated to BS4 standards!

His sense is also that the whole "pollution under control" mechanism in the city is largely ineffectual. The police during their periodic checking of papers of vehicles also look for the pollution control certificates but what this means in terms of the actual emissions emerging from the tail pipes of vehicles is anybody's guess.

An idea of how pollution control initiatives work or don't in the city is gained from the saga of use of hot mix bitumen for road repair. After giving the state government a lot of time to switch to the less polluting cold mix technology, the National Green Tribunal (NGT) ordered the shutdown of two hot mix plants. This brought to an abrupt halt all road repair work and in response to the state's plea, the NGT gave a reprieve of four months to the hot mix plants. But that deadline has come and gone and the city is nowhere near ending the use of polluting hot mix bitumen!

Mittal feels that the city is fortunate in having a better public transport system than many others. But this needs to be built upon by bringing in more electric vehicles, initially by retro fitting existing ones. Also, the transport authorities must restrict truck movements within the city during the winter months. ■

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# PUNE THEN & NOW

## An ecological map shows what the city is losing and how fast

Manjusha Ukidve & Ritu Gavandi  
Pune

**P**UNE was known as a green and picturesque urban paradise. It was a city people went to, to retire. Those days are long gone. The city is now a bustling industrial and manufacturing hub and home to the rapidly expanding IT industry with densities that match the economic opportunities it offers.

Rapid and ecologically insensitive development has led to the deterioration of the city's natural heritage as tree-lined avenues have made way for flyovers and low-rise, low-density suburbs rich in greenery have morphed into neighbourhoods congested with high-rises.

The change has taken place over the past three decades. But what is worrisome is that the pace has quickened in recent years. The hurry to grow and accommodate more people has resulted in the city's natural assets vanishing much faster now than they did earlier.

How can one keep track of this transformation? While it is easy to see what Pune is becoming, is it possible to have a record of what the city is losing? What were those green spaces and water bodies that simply disappeared? What is the condition of the local river?

A green map of Pune brought out by the Landscape Foundation India, a non-profit private trust, seeks to do just this. The Pune map is part of a larger effort in 2017 when the foundation initiated a series of studies of historical Indian cities that explored their changing relationship with nature.

A green map of the city of Delhi in Hindi and English was adopted as a pilot project (see *Civil Society*, March 2018). It identified ecologically and culturally significant sites while pointing out the main environmental concerns.

The Pune map, in English and Marathi, similarly attempts to highlight the role and value of nature in the city and how it has evolved over the years. It aims to create awareness about the nature hotspots of the city from the past and the present in an effort to inspire residents to actively participate in their protection and conservation.

Pune has turned its back on its rivers that are now polluted due to domestic and industrial waste. The hills and lakes that were once safe from the city have now been engulfed by development. While it is nearly impossible to bring back the original natural landforms and water bodies that have been permanently altered by urbanisation over the years, it is possible to conserve the remaining natural hotspots of Pune by sensitising city residents and by demanding ecologically sensitive urban planning.

**STORY SO FAR:** Pune lies in the Maaval region of Maharashtra, the hilly transition zone between the Sahyadris (Western Ghats) and Desh (Deccan Plateau), at the confluence of the Mula and Mutha rivers. Strategically located on the trade route that connected the western coastal region and the plateau through a number of passes and ghats, the region has enjoyed a prominent



The Pune map highlights changes in the natural environment of the city

place on the economic and cultural map of the Deccan since ancient times.

The early settlement of Punaka, the historical name of the city, was situated on the right bank of the Mutha, along its feeder streams. Ruled by different dynasties in succession, Punakavishaya was a region with small hamlets dependent on fishing and agriculture for sustenance that later combined to form a walled settlement known as Kasba Pune.

During the reign of the Peshwas in the 18th century, the city continued to grow and flourish on the Mutha's right bank, connected to the undeveloped other bank by a sole bridge called the Lakdi Pul. The topography of Pune was majorly restructured during this time as existing nullahs were diverted and lakes created, freeing a large tract of land from the danger of flooding. An important feature of this era was the large-scale waterworks undertaken at Katraj where an underground system was constructed that supplied water to the city through a network of aqueducts, wells and tanks.

During the early colonial period the city crossed the two rivers and nullahs

that had up till then defined its boundaries. Two cantonment areas were created by the British with a new landscape which had wide, tree-lined avenues and large open spaces, very different from the existing one. The natural green barriers of fields and farmland that lay between the old city and the cantonments were soon filled up by development. A number of bridges were built and development spread to the left bank of the Mutha. Dams were constructed over the river which became the chief source of water for the city and the earlier aqueduct system fell into a state of disrepair.

The later years of British rule and the post-Independence period saw rapid urbanisation and industrialisation leading to a loss of hinterlands and a change in the ecological character of the city and its surroundings. A number of large educational campuses were set up, which to date, add to the character of the urban landscape and gave the city its reputation of being the Oxford of the East.

A major event that left its mark on the city was the Panshet flood of 1961. Incessant rains caused the otherwise dry Mutha to flood, inundating both its

banks and causing great damage to life and property. The river that had been an important part of the socio-cultural life of the city, supporting recreation, religious as well as cultural activities, now became the cause of much disruption and change. As a result of the flood, the city's compact form was broken and it spread out rapidly, changing its relationship with the river forever.

**SPLITTING HILLS:** The hills are a prominent feature of the city's landscape which originally supported a mixed deciduous forest dominated by *Tectona grandis* (teak) trees. However, only a few remnants of this forest exist in the city today. Due to long periods of deforestation and stress caused by anthropogenic activities, the vegetation on most of these hills has been reduced to open grassland and scrubland. Hills under the jurisdiction of the Forest Department are partially protected and afforested. However, mostly non-native species have been planted and the hills no longer support rich biodiversity. The Vetal and Parvati Pachgaon Hill complexes support both monoculture and diverse native vegetation and are a popular roosting and nesting site for birds like the rock eagle owl, spotted owl, oriental honey buzzard and marsh harrier.

Baner Hill, to the west of the city, is home to a wide range of herbaceous flowering species. Community-driven plantation of native trees like *Bauhinia racemosa*, (apta) *Dalbergia sissoo* (shisam), *Cassia fistula* (bahava), *Gmelina arborea* (sivan), *Semecarpus anacardium* (bibba) and varieties of *ficus* along with water management initiatives have helped revive this land that had been reduced to a desolate scrubland. Once a continuous range and an important ecological corridor of the National Defence Academy (NDA), Baner Hill and Vetal Hill have now been separated by a four-lane highway. The hills that once contained the city within their boundaries have now been engulfed by development.

**DEGRADED WATER SYSTEM:** Pune lies in the watershed of the Mula and Mutha rivers. As the two rivers pass through the city, their network of natural streams and rivulets forms a dendritic drainage pattern, owing to the bowl-shaped topography of the land. These rivers, along with streams like the Ramnadi, Ambal odha, Nagzari and Bhairava nullah, function as wind corridors and linear open spaces within the dense urban sprawl. Moreover, their riparian edges, soil conditions and related flora and fauna are important ecological entities. The banks of the Mula-Mutha supported an ecologically rich riparian zone in the past but today only some stretches of both rivers still have their natural edge intact.

The majority of Pune's lakes are man-made reservoirs. Though few in number, they are an important natural element as they regulate micro climate, support a wetland ecosystem and contribute to the city's biodiversity. But pollution through the source stream and other inlets has led to large-scale eutrophication and slow deterioration of these lakes over the years, destroying many micro-habitats and the population of migratory birds. Lakaki lake, once an abandoned stone quarry, is now a relatively good wetland ecosystem due to active conservation efforts by local residents.

**OPEN SPACES:** Man-made landscapes such as institutions, parks and cantonment areas collectively sequester carbon and reduce the heat island effect in the city. They sustain a variety of small living beings and support various food chains. Pune's landscape character is defined by the vast number of institutional campuses present in the city that have a mature tree cover. *Ficus benghalensis* (banyan) and *Azadirachta indica* (neem) are common and often interspersed with garden exotics like *Polyalthia longifolia* (ashoka) and *Delonix regia* (gulmohar).

The Savitribai Phule Pune University campus is host to a variety of rare and heritage native trees and is a favourite roosting site for many birds. Empress Botanical Garden, an excellent example of a man-made urban forest, supports a dense tree canopy and a collection of old and rare flora.

Throughout the city, on local scale, bungalow neighbourhoods form green grids as each individual house is surrounded by tall trees and thick shrubbery on the margins. These grids function as green corridors and add to the natural wealth of the city.

In the past two decades, revival and restoration efforts like the stream at Osho Nala Park have attempted to convert wastelands into an urban green habitat for various birds, insects, reptiles and small mammals.

**WAY FORWARD:** Looking at the urban landscape today, one wonders about the future of the city's natural wealth. Will Pune be able to retain its green cover or will it perish with the ever-growing concrete jungle? If one were to go



The stream at Osho Nala Park



The garden at the Savitribai Phule University merges with the woods

by the city's citizen-led initiatives and intense activism to save its hills and rivers, one could be optimistic.

Community-driven plantation on hills with native trees, along with water management initiatives, have helped revive scrubland.

Successful initiatives like Lakaki lake have given hope. Once an abandoned stone quarry, this place is now a relatively good wetland ecosystem due to active conservation efforts by local residents. Restoration efforts like the stream at Osho Nala Park have attempted to convert wastelands into an urban green that is a habitat for various birds, insects, reptiles and small mammals. NGOs and the Municipal Corporation have initiated riverfront development projects that aim to reverse the harm caused to the river and restore its ecology along the



The banks of the Mula and Mutha rivers



Monoculture of *Gliricidia sepium* along a hilly tract

**Successful initiatives like Lakaki lake have given hope. Once an abandoned quarry it is now a good wetland ecosystem due to conservation efforts by residents.**

banks. Efforts are also being made to create awareness amongst citizens about Pune's rich natural heritage and these are paying off with more and more people joining the movement.

**THE PROCESS:** The research on Pune's history started with references from literature available in both Marathi and English. We also collected archival photographs, sketches and maps that gave us a good base to begin our work on the map. Our talks with historians and architects, notably Avinash Sovani and Sharvey Dhongde, provided us a good idea of the city's transformation over centuries. There were also a few old maps of the city but these were primarily made during the colonial period. It was a challenge for us to assimilate the



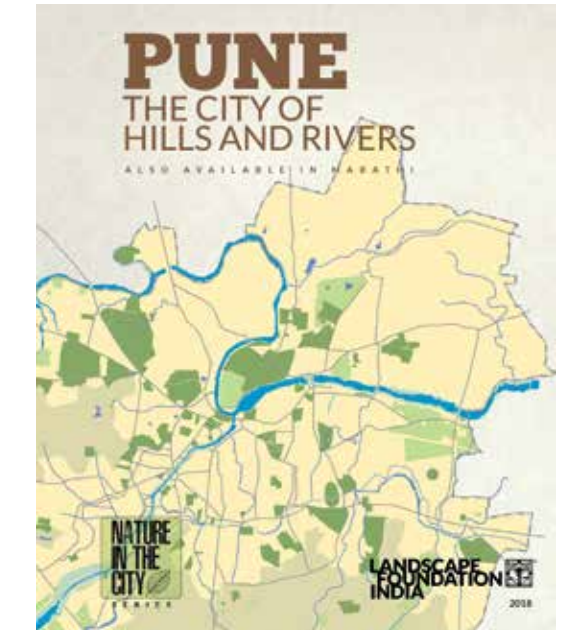
Pashan Lake



Parvati Hill



Model Colony Lake



The Pune Nature Map is available from the Landscape Foundation India. Email: [landscapefoundationindia@gmail.com](mailto:landscapefoundationindia@gmail.com)

textual references and the oral histories in the form of maps for the first section. Hand-drawn maps and sketches were created for the pre-colonial era, as well as the post-Independence period. Once these were made, a clear picture of the growth of the city and its natural features emerged. The maps helped us graphically establish a sequence of events that are important landmarks in the changing relationship between nature and the city.

Mapping Nature was equally challenging to compile. The Survey of India Map (2001) was the base on which we built our final map, adding details and including the changes that had occurred over the years (with the help of Google Earth Map). The objective was to represent the present condition of nature in the city — hills and rivers, natural and man-made water bodies, campuses, gardens and other open spaces. With the help of experts like Dr Nalawade, Dr Swati Gole, Ketaki Ghate, Dharmaraj Patil and Dr Ankur Patwardhan, various existing features, threats and potential opportunities for conservation were marked on the map. The research team made a number of exploratory field visits to observe and document the natural heritage of Pune through maps, sketches and photographs. These surveys helped us ground the information that we had acquired from literary sources and existing maps.

**TIMELINES:** It took us around three months, after initial discussions in March

2018, to do the background study, identify experts and collect base data like books, website references and base maps. This was followed by collaborative meetings with experts, identification of important aspects and establishing a clear methodology for further work. Extensive on-site survey and documentation led to the preparation of the first draft map that was again fine-tuned with inputs from experts. The final drawings in digital format started taking shape six months into the project and followed loosely the guidelines set by the Delhi map. Translation into Marathi took some time as the text had to be technically accurate, while being equally engaging and interesting to the lay person. The text, maps and illustrations were revised and fine-tuned by the team. It took us almost a year to present the map in the final format.

The funding of such research documentation projects is crucial, and we were lucky to get ready help from corporate houses who shared our concern for the city and its ecology. When research projects like these are supported by aware and sensitive citizens, it is the city that stands to gain. Apart from the money so generously donated for this cause, we are grateful to people who gave their time and expertise to the project. Their contribution is invaluable. ■

Landscape Foundation India is a non-profit trust founded by Geeta Wahi Dua and Brijender S. Dua. With a background in landscape architecture and architecture, they also conceptualise diverse landscape research works. They can be contacted at 011-41584375 and 9810600754. Email: [landscapefoundationindia@gmail.com](mailto:landscapefoundationindia@gmail.com). Website: [www.landscapefoundation.in](http://www.landscapefoundation.in)



## THE REALLY BIG EV IS HERE

### Hyundai changes the game with Kona

**Murad Ali Baig**  
New Delhi

THE launch of the Kona by Hyundai in July has raised the bar for expectations from electric vehicles (EVs) in the Indian market. It offers almost the same acceleration and power as a big petrol or diesel engine and its battery can take you from Jaipur to Agra via Delhi. It has the oomph of an SUV, and at first glance, resembles Hyundai's Creta. It is not lacking in terms of styling and interiors either.

In India thus far, electric cars have been souped-up golf carts. With the Kona the game has changed. It is a full-fledged SUV whose motor has a huge torque of 40.27 kgm that delivers roughly as much power to the wheels as a big 2800 cc internal combustion engine.

With so much power, the Kona is capable of furious acceleration from standstill to 100 kmph in just 9.7 seconds. It can also maintain high speeds though, during the launch, it was restricted to 150 kmph in the Buddh International Circuit in Noida.

Anyone buying an electric car tends to worry about how far one can go. How far can the battery take you and how to recharge quickly? Well, batteries have gone through a transformation and the Kona comes with a new generation lithium-ion battery that delivers about 450 km on a full charge.

A portable DC (direct current) quick charge device (provided with the car) can provide an 80 percent charge in just 57 minutes. A full charge from a normal domestic electric point may need 19

hours. But at a recharge station it could take six hours. The battery, however, cannot be swapped.

For a full charge, just 39 units of electricity are consumed, which means you spend about ₹200. Many potential buyers who may be concerned about the life of the expensive battery pack should be reassured by Hyundai's offer of a huge eight-year warranty with virtually unlimited mileage in addition to the three-year overall warranty. As there is no engine and gearbox and so few moving parts, there will also be very little service needed during its lifetime.

**The Kona can go to 100 kmph in just 9.7 seconds. It is a very complete SUV with stylish interiors.**

The Kona is priced at ₹25 lakh, which is about double the price of the Creta. But consider the minimal running and maintenance costs as savings and the price difference begins to narrow. There is also a tax-break of ₹1.5 lakh on interest paid on loans for electric vehicles proposed in the Union budget.

Apart from its cost economics, the Kona is a very complete SUV with good looks, LED headlights and tail lights, excellent interiors including ventilated

front seats. There is also a huge array of electronic gadgets for communications, navigation and entertainment as well as many new features for safety and comfort. Other cars may have ABS but the Kona offers ESC or electronic stability control and VSM or vehicle stability management to make driving safe in all road conditions. There is at present only one premium model with leather seats, leather-wrapped steering wheel, sun-roof, R17 alloy wheels, sporty roof rails, LED headlights with auto levelling functioning, impact sensing auto door locking and unlocking, and many other features.

It takes time for buyers to become confident of using any new technology. But Hyundai comes with the experience of having sold over 300,000 electric cars worldwide and knows that what happens elsewhere in the world will also happen in India eventually. Ten years from now most new cars and bikes will be electric and we will forget that we were once so scared. Of course, much more infrastructure is needed by way of recharging stations and switching stations where the complete battery pack is quickly removed and replaced with another pre-charged pack.

In the recent Budget, the government announced a step to encourage EVs by reducing the GST from 12 to five percent and concessions in customs duty on imported batteries, motors and some other components. This is encouraging but it is not enough. There are no fiscal incentives like the substantial subsidies offered by many other countries. The huge savings in fossil fuel consumption and foreign exchange savings, to say nothing of protecting the

environment, fully justifies not just a tax holiday but also direct incentives for buyers.

In another decade EVs will undoubtedly be popular in India and this will mean a substantial reduction in consumption and import of petroleum products though fossil fuel vehicles will continue to be needed for the existing fleet of cars, bikes, trucks, tractors and buses until they get scrapped.

The process of a switchover will also mean the decline of repair facilities because EVs need very little repairs and maintenance. It could take a decade before all IC engines are scrapped, but when that happens it will be the end of petroleum imports as well.

EVs are revolutionising global mobility. Last year 5.6 million EVs were sold globally of which half were sold in China. Actually, the EVs recorded are limited to cars and China has many more electric two-wheelers. EVs are also becoming very important in the US, Europe, Japan and other countries and every auto major in cars, bikes and other vehicles is investing heavily to introduce them.

Nissan sold 360,000 of its EV, the Leaf, and is the world leader today. Tesla sold 240,000 of its classy vehicles and is perhaps the best known. Other well-known cars are Chevrolet's Bolt, Ford's Volt and Focus, Mitsubishi's 1-MIEV, BMW's i3, and Mercedes' B-Class. Toyota and Volkswagen are working together on EV development and there are several other strategic alliances.

The shift to EVs is mainly because the world recognises that some 900 million vehicles fuelled by fossil fuels like petrol, diesel and LPG on global roads are major polluters. Fossil fuel vehicles are doomed because EVs are much more efficient than internal combustion engines and are thus cheaper to own and use in the long term. Many people, however, have had deep reservations in adopting this new technology because many of the early EVs were very expensive, very heavy and offered a limited driving range. But these limitations have increasingly been done away with.

The internal combustion engine is inherently inefficient as it has to waste about 70 percent of its power in sucking in fuel in one piston while compressing it in another as well as in expelling the burnt exhaust gases from a third. A conventional car has to also move power through a gearbox and wastes energy in the cooling system, turbochargers and so on.

In contrast, an electric motor just spins efficiently in one direction so that almost all the energy of the motor is delivered to the wheels. The power train, therefore, is essentially just the big battery pack and the electric motor. This difference in power efficiency means that the torque or power delivery of a 10 hp electric motor would be roughly the same as a 30 hp internal combustion engine.

The power ratings are also very different. A typical 100 hp engine delivers 100 hp only at its maximum rated speed and usually operates at about a third of this peak power unlike an electric motor that delivers the same power output at low speeds and high speeds. With this an EV can accelerate from standstill to top speed without any need to change gears. An EV also makes no sound and so it needs a virtual sound generator to warn other road users.

India's first electric car was the Reva which was introduced in 1994 and sold some 4,000 units to 26 countries before it was bought by Mahindra and



DC quick charger



Option of driver-only air conditioning



Front ventilated and heated seats



ECO driving information



Distinctive split LED head lamps with LED DRLs

Mahindra (M&M) in 2010. It was essentially a small two-seater passenger version of a golf cart with a small motor just capable of providing air-conditioning. It was too expensive and impractical for most people in India but quite popular in the 26 countries that offered incentives and special facilities like a zero congestion tax in central London.

It was followed by a number of hybrid cars that were conventional cars with an electric power boosting system. Several hybrid models like the Honda Accord, Toyota Camry, Maruti Ciaz were sold even though they were rather expensive. Today M&M sells a Verito EV and the small e2o but many other new models will soon be on the market

including the MG EZS, Nissan Leaf, WagonR-EV, Tata Tigor, Maruti Ertiga, Tata Atroz and M&M's e-KUV300. Other car makers have ambitious plans for India too as it is now the world's fourth largest car market. Renault may introduce a small Zoe and its larger K-Ze, Ford the Aspire EV and Nissan its Leaf.

India also has more than 20 makes of e-rickshaws, about five electric scooters, 10 electric motorcycles mostly made in the unorganised sector using kits imported from China that, shocked by its terrible environment, vigorously adopted EVs just a decade ago. Today almost all of China's two-wheelers, including pedal cycles, are electrified. ■

# Speaking up for deaf artists

Rwit Ghosh  
New Delhi

IN 2013, when Smriti Nagpal went with her sister to an art exhibition, she met Amit Vardhan, a hearing impaired artist. Vardhan had graduated with a master's degree in fine arts from the Delhi College of Arts and Commerce (DCAC). For 15 years he couldn't find a job that matched his skills because of his disability. So he was working with an NGO, doing manual labour.

"He asked me for an alternative job where he could actually use his talent and the skills he had learnt in art college," recalls Nagpal.

Vardhan's situation upset her deeply. Understandably so. Nagpal knew sign language. Both her brother and sister are hearing impaired. Since she comes from a business family she began to think of how she could start a venture which would employ artists like Vardhan.

A couple of months later she called Vardhan and asked him to create a sample of his work so that she could understand his capabilities. What she received surpassed her wildest expectations. Having found herself one artist, she went back to DCAC to learn the ground realities that hearing impaired people face every day.

The DCAC has reservations for people with disabilities. But Nagpal got to know that students who were hearing impaired did not mingle with regular students. That situation continues. Hearing impaired students who graduate from DCAC still don't get jobs in their area of specialisation.

Nagpal started Atulyakala, a social enterprise. The idea was to break stereotypes about the hearing impaired and prove they are as good as so-called normal people. She had some money left over from her Doordarshan presenter days. She was also offered a massive hall which she accepted and converted into office premises.

"Between our inventories, capital investments in fixtures and furnishings, we put in about ₹1.5 lakh," she says. An investor added another ₹5 lakh.

"As social entrepreneurs, we get very attached to our company's social cause. We can't go completely commercial," says Nagpal, explaining why she couldn't attract more investment.

Initially, Atulyakala started as a design house designing logos for brands and creating designs according to briefs from clients. However, Nagpal realised that working as a design house was not sustainable. "If I was not there to communicate between the client and the designer, then the client's briefs would not get explained to the designer. I can't expect every client to know sign language and I can't expect every interpreter to work with the same passion that I do," she says.

Nagpal realised she couldn't micro-manage everything. "You want to just delegate work after a while," she says. With her team she started to brainstorm on how they could change their business model.

"I was always travelling a lot and collecting little artefacts from the places I visited. Things that don't require a lot of thinking or decision-making," says



Smriti Nagpal and Amit Vardhan converse in sign language



Nagpal poses with a bag designed by one of her artists

Nagpal. From that was born the idea of making attractive useful products that people would buy.

Atulyakala began by designing notebooks and soon went on to making bags, mugs, fridge magnets and framed artwork by their graphic designers at affordable prices, so that people wouldn't think twice about buying.

"I wanted people to understand that the things sold by our brand are done by people with a hearing disability," says Nagpal. The identity of the brand was important to her. She also took care to ensure that Atulyakala wasn't seen as an NGO.

Once business began to pick up, Nagpal realised that people didn't have any reservations about who had made the products they bought. They just loved the products.

Atulyakala's head office in Delhi consists of 15 people. Seventy-five percent of their staff is hearing impaired. In 2017, they even launched a clothing line called Sign. "We embroider and print sign language on the clothes so that every time someone picks up a dress or a T-shirt they also learn what the

sign on their clothes means," says Nagpal.

With Atulyakala expanding to other cities, Nagpal has had to hire more staff. All new recruits are taught sign language so that they can communicate with employees who are hearing impaired.

For Vardhan, the company has been the life line he was waiting for. He signs emphatically while Nagpal translates. He says, "When I looked for opportunities, none came my way. But now I can put my creativity to good use. People appreciate and respect me."

Vardhan sits in the Oxford bookstore in Connaught Place in Delhi, which stocks Atulyakala's products. He shows customers his work with enthusiasm, pointing out his sketches and designs. An ornate design of Frida Kahlo ranks amongst his favourites. "It feels great to see people connect to my designs and then start picking up products," he signs.

Atulyakala doesn't have a brick and mortar store. Instead, the company has multiple pop-up stores across India, mostly in collaboration with boutiques and design studios. Apart from Delhi, Atulyakala has a presence in Pune, Ahmedabad, Bengaluru and Mumbai. They even have a branch in Copenhagen which takes care of sales in Europe. "We are shifting our focus to Dubai and parts of Italy," says Nagpal, who has set her sights on expansion.

According to the 2011 Indian census, roughly 1.8 million people in India are hearing impaired. However, the National Association for the Deaf puts the figure at 18 million. But one of the biggest challenges people who are hearing impaired face is that India does not have a composite sign language. Access to formal education becomes tough due to the lack of teachers knowing sign language. This explains why only two percent of hearing impaired children attend school. Illiteracy and low economic opportunity are rampant among them.

Atulyakala plans to support the education of a hearing impaired child in a school for the deaf in India. Nagpal is keen that her company doesn't deviate from its core philosophy. "Our website will show the impact of how many products we are selling and whom we are impacting," she says. ■

PICTURES BY SHREY GUPTA

# Drones, AI for better farms



KIRAN KARNIK

AGRICULTURE is now a comparatively small and decreasing part of India's economy, accounting for just about 15 percent of the GDP. However, it is still the means of livelihood for 44 percent of our population. This mismatch between the two figures indicates high disguised unemployment, poor productivity and low incomes of those engaged in agriculture, with output per capita (of farmers) and per hectare both being dismally low. Migration from villages to urban areas will help only to a limited extent. The solution lies in big increases in agricultural productivity, and the creation of higher-income non-farm rural jobs. This piece explores how technology could play an important role in boosting the rural economy.

In the past, major increases in productivity were driven by hybrid seeds combined with high fertiliser inputs. The resulting 'green revolution' of the 1970s ended the derogatory 'ship to lip' food supply, dependent on imported grain. However, over the years, excessive use of fertilisers has degraded the soil. Free electricity facilitated the pumping of groundwater, encouraging a shift to water-intensive crops and a depletion of groundwater resources. These long-ignored side effects of the green revolution and of faulty policies are now starkly visible.

More recently, genetically-engineered seeds have led to a big increase in cotton output. Such genetically modified (GM) crops are, however, the subject of much controversy, especially for food items. Thus, BT brinjal, a well-proven technology, is banned in India. Yet, genetics holds tremendous promise: better nutrition, less water and pesticides, higher yields. At the same time, there is deep concern about the health impact of GM crops, especially their long-term effects. Therefore, while many countries permit the use of GM seeds, India is yet hesitant. Reportedly, though, imported edible oils extracted from GM seeds are sold here, but local use of such seeds is banned!

Our policy on GM foods should not be shaped by techno-evangelists and profit-driven seed

companies, nor by dogma and Luddites. Genetics and bio-technology can revolutionise agricultural productivity; vague fears should not hold us back, but caution and scientific evidence must guide a decision.

Less controversial are drones. The agricultural use of these amazing unmanned aerial vehicles — to give them their proper name — is comparatively recent, but both, benefits and further potential, are already clear. Drones can capture images at the level of individual farms, enabling analysis to guide each farmer about crop health, the need for more water, fertiliser or pesticide, and providing yield estimates. The last is also used by insurance companies, enabling quicker assessment and payment for any crop losses. A newer use of drones is to carry and spray pesticides and fertilisers. This is part of 'precision farming', which provides optimal inputs at



Drones can carry out a host of agricultural operations

just the right time for each farm and thus enhances productivity and profitability. It also minimises pesticide and fertiliser use, with attendant environmental benefits, besides saving costs.

Another use of drone imagery is for terrain mapping to optimally locate bunds or check-dams for water storage and conservation. Growing problems related to water, made worse by extreme climate events like torrential rainfall or droughts, makes this a vital application of great value to farmers and rural life.

Satellite imagery and other data used for weather prediction have now become commonplace. Soil mapping, land-use classification and crop yield predictions are used for policy and planning, as also to take timely action (e.g., to import grains or edible oil, depending on the forecast yield). With the

increasing power of data analytics, combined with machine learning and artificial intelligence, the models for weather prediction have become far more accurate. This, together with data on soil, water availability and past records, enables quicker and more accurate forecasts of yields. The ability to localise the prediction enables banks to decide on appropriate loans and insurance companies to decide on premiums for crop insurance. Others selling products in rural areas — from two-wheelers and tractors to soaps and soft drinks — can estimate likely demand. Overall, the gains to the rural economy are immense.

Photographs of a crop, taken on a smartphone, can be sent to an expert who — with the aid of AI — can respond with a diagnosis of crop health or disease and advise on corrective action: pesticide, more fertiliser or water, etc. Also available to the farmer via

apps on the cell phone are market prices for his crop in different *mandis* (markets), weather forecasts and warnings. The online electronic National Agricultural Market (e-NAM) can bypass the traditional *mandi*, where the middleman calls the shots, and put power in the hands (literally, through the cell phone) of the farmer.

New technologies for storage, cold chains and processing of agricultural produce will all greatly aid farmers, while creating non-farm employment. Services to support these will add further jobs and income.

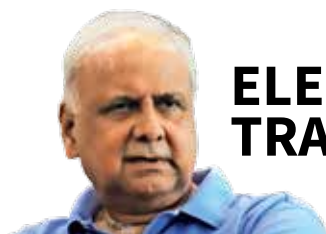
The IoT (Internet of Things) will enable soil moisture or crop (water) stress sensors to link with computers and pumps that will automatically release the required quantity of water (calculated through data analytics/AI models) at the right time. Ideally, water-saving drip irrigation and solar-powered water pumps will be used.

New online platforms (some of which already exist) will bring the 'sharing economy' to rural areas, enabling Ola-like hiring of tractors or farm equipment on a pay-per-use basis through a simple cell phone app. This is of special value to small farmers, making possible far greater productivity and income for those who cannot afford the capital costs of such equipment.

These and many other technologies have the potential to transform agriculture. Most important, hundreds of entrepreneurs with innovative ideas are now working on AI models and apps of use in villages. Technology and these start-ups have begun to change the face of the farm economy; emerging technologies hold promise to truly revolutionise rural India in the near future. ■

Kiran Karnik is an independent policy and strategy analyst and a writer. His most recent book is *eVolution: Decoding India's Disruptive Tech Story* (2018).

# Why is 'one election' a priority?



## ELECTION TRACKER

JAGDEEP CHHOKAR

Question: Who is likely to be the most knowledgeable on what electoral reforms are needed?

Options: (a) Those who have contested one or more elections in the past 10 years.

(b) Leaders of registered and recognised political parties.

(c) The Election Commission of India.

(d) Election experts who discuss elections in TV debates.

(e) None of the above.

In my humble opinion, the correct answer should be (c).

THE Election Commission of India (ECI) is a constitutional institution set up under the provisions of Article 324(1) of the Constitution of India, which says:

"The superintendence, direction and control of the preparation of the electoral rolls for, and the conduct of, all elections to Parliament and to the Legislature of every State and of elections to the offices of President and Vice-President held under this Constitution shall be vested in a Commission (referred to in this Constitution as the Election Commission)."

This constitutional institution has been conducting elections to Parliament, assemblies, and the offices of President and Vice-President for almost 70 years since it was set up in 1950.

Electoral reforms have been talked about in India since 1967 at the very least. During this time, the ECI has sent consolidated lists of electoral reforms to the government twice, once in July 2004 and again in December 2016. In July 2004 the list contained 22 items. This number had gone up to 47 in December 2016. None of these two lists contained a proposal to hold parliamentary and assembly polls simultaneously.

However, the one electoral reform that seems to have caught the fancy of the prime minister is "simultaneous elections". Though mentioned occasionally for over 20 years, and also supported by L.K. Advani, it found mention in the BJP manifesto for the 2014 Lok Sabha election which said:

"BJP is committed to initiate electoral reforms to eliminate criminals. The BJP will seek, through consultation with other parties, to evolve a method

of holding Assembly and Lok Sabha elections simultaneously. Apart from reducing election expenses for both political parties and Government, this will ensure certain stability for State Governments. We will also look at revising expenditure limits realistically."

Several steps were taken to make this happen, including a parliamentary committee studying it and submitting a report, and the curious and unusual action of a very senior official of the Prime Minister's Office (the principal private secretary (PPS) to the PM).

The official phoned the Chief Election Commissioner (CEC) in January 2015, saying that there was a "strong feeling of having simultaneous elections for both Parliament and the State Assemblies", and pointing out that "repetitive"



**If the intention is to move to a unitary and presidential form, it would be far better for the govt to say that and initiate a national debate.**

elections cause "lots of disruption, both in terms of implementation of various schemes as well as socio-economic scenario". He also informed the CEC that elections resulted in "tremendous financial cost to the State", ending with a very revealing sentence, "After all, elections cost money".

NITI Aayog produced a 'discussion paper' in April 2017, arguing for simultaneous elections. A large number of seminars, discussions and workshops were organised by diverse groups all over the

country but no consensus seemed to emerge.

Then came the 2019 Lok Sabha elections.

Simultaneous elections were again a part of the BJP manifesto but there was no mention of it during the unprecedentedly long campaign. But, even before the 17th Lok Sabha met for its very first session on June 17, an all-party meeting was announced on June 16, to be held on June 20, to discuss the 'One Nation, One Election' issue. Though an invitation was extended to all political party presidents with presence in Parliament, 21 parties attended while 11 declared they would not.

The outcome of the meeting, as announced by Defence Minister Rajnath Singh, was: "The prime minister will form a committee to look into the possibilities of simultaneous polls. The exact nature of the committee will be made public."

This, after three years of deliberations across the country which did not yield the desired outcome!

There are essentially two arguments in favour of simultaneous elections, as summarised by the PPS to the CEC — money spent on elections and hindrance to development. These and all the other supplementary arguments have been conclusively rebutted by various commentators in a variety of fora.

Two representative pieces are "Simultaneous Elections: Striking at the Roots of Parliamentary Democracy" ([www.adrindia.org](http://www.adrindia.org)) and "The case against simultaneous elections" ([www.thehindu.com](http://www.thehindu.com)).

Why this intense desire to hold elections to Parliament and assemblies together? After considering all possible reasons, the only one that stands out is to move from a federal polity to a unitary state and from a parliamentary form of government to a presidential form.

That moving from a federal to a unitary form of government violates the 'basic structure doctrine' laid down by the Supreme Court in the famous Kesavananda Bharati judgment in 1973 which said that though Article 368 of the Constitution does give Parliament the power to amend the Constitution, Parliament does not have the power to amend the basic structure of the Constitution. And since the "federal character of the Constitution" has been repeatedly declared to be an integral part of the 'basic structure', this just cannot be done.

The insistence of the government is baffling. If the intention is indeed to move to a unitary and presidential form, it would be far better for the government to say that and initiate a national debate specifically on that issue. Insisting on trying to do this by sleight of hand will not work and will only result in wastage of national resources. ■

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

# China's shadow on South Asia



## DELHI DARBAR

SANJAYA BARU

CHINA's dramatic and sustained economic rise over the past quarter-century has impacted the global economy and global geopolitics. In purchasing power parity (PPP) terms, China has become the world's largest economy, while in terms of the US dollar, China is the second biggest economy. Its economic rise has altered the global balance of power. Consequently, all countries, big and small, have been re-adjusting their relations with China. Understandably, therefore, China's rise has impacted South Asia. China's gross domestic product (GDP) in purchasing power parity (PPP) terms has been estimated to be more than the combined GDP (PPP) of all South Asian economies.

This, in turn, has had consequences for India's relations, both economic and political, with its near and outer neighbourhood. China's large foreign exchange reserves, that peaked at \$4 trillion in 2014 and are at present around \$3.5 trillion and amount to more than the combined GDP, in US dollars, of all South Asian economies, have made it potentially a larger source of aid and investment. As a trading nation, China has acquired both exporting and importing power, with over 13 percent share in world merchandise exports and close to 11 percent share in world merchandise imports in 2017.

The direction of China's trade has been such that it has largely exported manufactured goods to developed economies and imported raw materials and intermediates from developing ones. In Southeast Asia, China is the dominant 'importing power' providing markets for Southeast Asian exports. While China has emerged as a major trading partner of South Asian economies, it is more an exporter to rather than an importer from South Asia, running trade surpluses with all South Asian trading partners.

China has also emerged as an important source of aid and investment. Net foreign direct investment (FDI) inflows into China, estimated at \$139 billion in 2018, now match FDI outflows, estimated at \$130 billion in 2018. China's share of world official development assistance has also been on the rise. In the period 2000-14, China was estimated to have provided \$354.4 billion official funding, mostly to developing economies, compared to \$394.6 billion

provided by the US during the same period.

As early as in 1991, India's National Security Advisory Board observed that "China's relentless pursuit of world markets and its drive to seek membership of the World Trade Organisation has created new challenges for India in the sphere of both trade and foreign policy." The note emphasised the geopolitical challenge India would face from China's economic rise and drew attention to the possibility that China would emerge as the dominant economic partner of most of India's neighbours.

Not surprisingly, a decade ago some of India's neighbours even sought the inclusion of China in the South Asian Association for Regional Cooperation (SAARC) on the grounds that China was an important economic partner of most SAARC members. As Imtiaz Ahmed, executive director of



the Regional Centre for Strategic Studies, Colombo, put it, "the message behind the trend of globalisation is that the region has to include China, which has now become a 'South Asian country' for all practical purposes. This is because South Asian countries, for example, India, Pakistan, Bangladesh and Sri Lanka, have very close and strong ties with China in terms of trade and development. In essence, it is geo-economics rather than history or culture that shape relations between or among nations in the contemporary era."

Students of geopolitics are familiar with the so-called 'string of pearls' argument that draws attention to China's growing political and military relations with India's neighbours, especially Pakistan and Sri Lanka. However, more than its military ties with the region, it is the economic opportunities that China presents that are often cited as appealing to India's neighbours. It has become commonplace for commentators in China and Pakistan to assert that China is a South Asian nation because of the growing geo-economic links.

What precisely are China's geo-economic links? Has China become an 'engine of growth' for South Asia? Will China's enduring trade surplus with major South Asian economies contribute to the region's 'de-industrialisation'? Are South Asian economies more dependent on China or India for their economic growth? These questions should be objectively addressed to understand the real magnitude of the challenge China's rise poses to India in South Asia.

Is China an 'engine of growth' for South Asia? There are four ways in which a country can become an engine of growth for another: as a market, a source of investment, of low-cost finance and remittances from overseas citizens and firms.

China runs a trade surplus with all South Asian economies. Hence, China remains a net beneficiary of inter-country trade. Rather than China emerging as a market for less developed South Asian economies, the latter remain a market for Chinese exports.

While China has become a source of FDI, a bulk of Chinese FDI goes to developed economies and to East and Southeast Asia. South Asia's aggregate share in Chinese outward FDI is less than 1.5 percent.

Most of China's overseas development assistance (ODA) goes to countries in Africa and Southeast Asia. In South Asia only Pakistan and Sri Lanka have received some assistance but even this remains limited. Here again, questions have been raised both about the cost of financing and conditionalities attached to tied aid where the host nation has to accept both Chinese labour and machinery imports for projects funded by Chinese aid.

Finally, remittance flows. India is a far more important source of remittance income for South Asia's less developed economies than China. Low remittances into South Asia from China shows that China has not been able to provide employment opportunities to South Asian labour and professionals.

In sum, China's contribution to South Asian growth is limited. Rather, by sustaining large trade surplus with each of the South Asian economies, China may well be inhibiting growth in the region. India also runs a trade surplus with all South Asian economies, albeit much smaller. The Modi government has once again resurrected the policy of "non-reciprocity" in trade liberalisation originally proposed by Prime Minister P.V. Narasimha Rao in the early 1990s, then popularised by Prime Minister I.K. Gujral as the 'Gujral Doctrine'. It is significant that in his very first public statement as external affairs minister, S. Jaishankar suggested India should not always seek reciprocity with her neighbours and should be generous in seeking closer economic relations. This is a wise path to walk. ■

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

# Bridging the trust deficit



## VILLAGE VOICES

R. BALASUBRAMANIAM

WE live in a world where we see such degradation of human values and corruption all around that we now believe this is the only way to be and prosper.

A few days ago, I was buying mangoes from a street vendor. While he weighed the mangoes, the first thought that crossed my mind was, "Are his scales accurate? What if he tries to include a rotten mango in my selection of the fruit?" It was as though I expected to be cheated and wasn't even willing to imagine that the fruit-seller could be an honest person.

How many times has each one of us wondered, when we get into an auto-rickshaw, if the meter has been tampered with or if the auto driver is out to fleece us? Why is it that we are no longer willing to believe that there are still plenty of good people around and that everyone is not waiting to swindle us?

A friend of mine once told me that she was returning home from office alone and the streets were dark as there was no power. She anxiously tried to phone her brother to ask him to pick her up from the bus stand where she had alighted. As she could not get through to him, she decided to walk home, nervously wondering whether someone would suddenly come up and snatch her chain or try something worse.

Noticing her fearful expression, a middle-aged person went up to her and offered to walk with her to her house. My friend's first thought was that this person was up to some trick. But the person walked with her without striking up a conversation and made sure that she reached home safely. As she recounted the incident, my friend was embarrassed that she had suspected the intentions of this good samaritan.

What or who is responsible for this situation? Is the trust deficit culturally ingrained in Indians? Or is the social and economic stress of modern-day existence causing us to be wary of everyone we interact with? None of us pause to consider that our lives are now filled with negativism and that we are constantly reinforcing an environment of suspicion

and mistrust. In the process, we have stopped seeing the good in ourselves and others.

What has happened to our society and the values that guide it? Can we learn from our indigenous friends and their traditional wisdom?

I remember an incident that occurred in 1988. We had just started a school for tribal children in Brahmagiri in a makeshift cowshed. Cooking and having lunch with the first batch of 28 children was great fun. Some of us would decide the menu, which unfailingly was *ragi* balls and *sambhar*, and a few of us would collect wood to fire our three-stone hearth. We would chop the small number of vegetables that we could lay our hands on. A few children would then make the cooked *ragi* flour into small balls. Some others would take on the



SHREY GUPTA

extra *ragi* ball for her and was quite surprised when I saw him make only 28. This roused my curiosity and I started watching him keenly. All 28 plates were laid out. I saw him seat his sister next to him. Slowly and surely, he broke his *ragi* ball into two and shared it with her.

After the meal, I took Manju aside and asked him why he had not made a 29th ball for his sister. With disarming innocence, this tribal child gave me an insight into the value system that these simple yet refined tribals possessed. He told me that his parents had gone to the local market to sell their bamboo ware. He wanted to make sure his sister was taken care of but he also did not want to miss school. He felt that it was his responsibility to feed her and he did not want his classmates to share his burden.

I realised that Manju was educating me. He was getting me to unlearn all the selfishness that I had grown up with. He was helping me understand that I needed to take responsibility for my actions and not transfer my burdens onto society, my family and friends. He was making me realise that there was a teacher in each person I met and in each event that occurred around me.

I could not stop my tears. Young Manju stood around bemused, trying to figure out what he had said that upset me so much! For him, it was just another day, that was the way he lived. His values came from his people, his culture and his family who lived in harmony with nature. There is so much that we can learn from around us and life would indeed be

better if we did so.

Our family, school, environment and the people we live with shape our values. Our daily interactions and experiences constantly shape our behaviour and attitudes towards society and ourselves. We need to always remind ourselves that each one of us is born innately good and filled with humaneness. Education, experience and our daily interactions with people and society make us reactionary and wary of everyone.

What we need today is to change all this. We need to understand that 'being good and doing good' is the way we can change the present situation. Societal values are an aggregate of what each of us manifests and all that is needed is for us to change our attitude and perception of life. We need to bring back trust and love in our interactions. Then life would be worth living and we would not have to be wary of the man next to us. ■

Dr R. Balasubramaniam, founder of the Swami Vivekananda Youth Movement, Mysuru, is a development activist and author. www.drbbalu.com

# LIVING

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SUSHEELA NAIR



The Sultan Ahmet Mosque

## Istanbul and its many charms

### Palaces, mosques, museums and great food

Susheela Nair  
Istanbul

THE unique city of Istanbul in the north-west of Turkey is, amazingly, the only city in the world straddling two continents. In fact, not only does it link Europe and Asia, it also fuses different worlds — the Occident and the Orient, the Islamic and non-Islamic.

Turkish history is replete with many different cultures. First, the Hittites settled here, then the Greeks, followed by the Romans. When Christianity spread, it found a solid base here, creating the empire of Byzantium. And finally, the Ottomans invaded and turned the country into an Islamic nation.

Istanbul is often mistaken to be the capital of Turkey. That honour goes to Ankara. But Istanbul is an interesting city, a synergy of many influences.

All the key attractions are within driving or

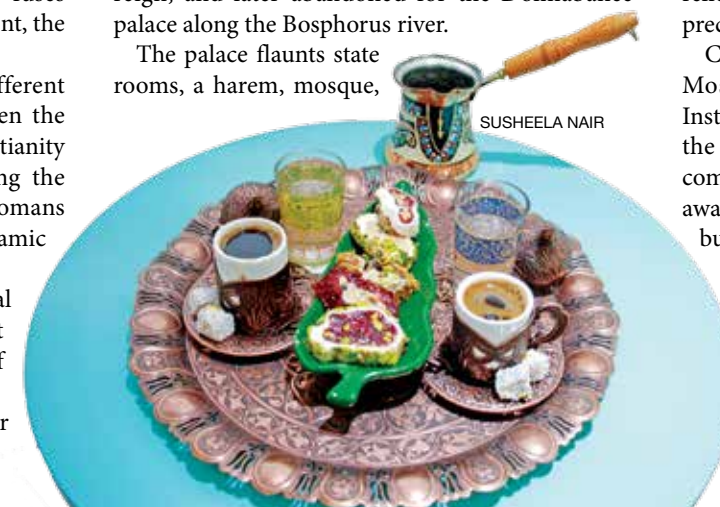
walking distance. We started with Topkapi Palace which is an outstanding museum. There were three museums to explore before we got to the main palace, which made the excursion exhausting but very rewarding. The palace was home to the Ottoman royalty for 400 years of their 600-year reign, and later abandoned for the Dolmabahce palace along the Bosphorus river.

The palace flaunts state rooms, a harem, mosque,

treasury, library, open pavilions and a row of royal kitchens set amidst landscaped gardens overlooking the Marmara and the Golden Horn. Its plain exterior is deceptive. Inside, the palace sports flashy interiors with opulent thrones, ornaments, armour, daggers, rose water sprinklers, writing boxes, holy relics variedly made in gold, enamelled or set with precious stones, paintings and fabulous china.

Commanding the city's skyline, the Blue Mosque with its six minarets is the most Instagrammed monument in Turkey. It's also called the Sultan Ahmet Mosque, after the sultan who commissioned this labour of love. Sadly, he passed away a year before the monument was ready and is buried close by. Every inch of space at the Blue Mosque is covered with decorative tiles, painted pillars, calligraphy, woodwork and ivory inlay. We had a look at the rare blue Iznik tiles, clicked photos of its massive chandeliers and exited.

Continued on page 32



SUSHEELA NAIR



SUSHEELA NAIR



The Grand Bazaar is the world's oldest example of a shopping mall

The Blue Mosque is close to other famous sights like the Hagia Sophia, aka Saint Sophia, a basilica reconstructed in AD 535 by Justinian the Great. The monument was the largest cathedral in the world in its time. When Mehmet the Conqueror captured Constantinople (renamed Istanbul) in 1453, he declared it a mosque and called it Ayasofya. Then the Ottomans invaded, and the mosaic Christian symbols were hastily plastered over with Islamic designs and minarets were added, turning the monument into a mosque. Carefully restored, it is a museum since 1933 and experts have refurbished some of the old mosaic paintings. When we walked through this magnificent structure, we got to see part-Islamic, part-Christian designs. The ceiling is beautiful, with partly-restored mosaics of Mary with Baby Jesus and Angel Gabriel. Right next to them, we saw typically Islamic designs. It's the coming together of two civilisations which were at war for centuries.

No trip to Turkey is complete without a visit to the Grand Bazaar. It's the world's oldest example of a shopping mall with its labyrinthine lanes and massive structure. Everywhere there are shops selling jewellery, furniture, carpets, evil eye trinkets, leather goods. It's an overwhelming sight. History resonates here with interiors predominantly Byzantine in form and decoration with Ottoman overlay of chandeliers, ablation basins and medallions inscribed with fine Arabic calligraphy.

Reputedly the largest covered bazaar in the whole world, a sprawling 30,702 sq m, the Grand Bazaar or Kapali Carsi (covered bazaar) is unlike any urban shopping mall and yet serves the purpose of one. Its exterior is a nondescript stone grey. There are no signboards, show windows or displays, only a stream of people entering it. What comes as a surprise is that it has as many as 18 large and small entrances, 65 wide and narrow paved streets and 3,800 shops! What awaits us is bewitching — a labyrinth of painted vaults and arches, high windows with sunlight filtering in, lanterns, bright lights, shops overflowing with tempting goods and marble fountains.

You will find all types of Turkish carpets and rugs, gold chains, rings, brooches, bracelets and necklaces, chunky and filigreed silverware, colourful scarves edged with finely crocheted lace, embroidered blouses, a flood of leather and metal goods, onyxware, ceramics, and so on.

Another famous market is the Egyptian Bazaar (aka Spice Bazaar) near the Bosphorus river. Named after the Egyptian traders who came to buy and sell spices, among other things, it is an explosion of tastes and smells. It's like your average market, but with every imaginable colour on display. Spices, sweets, pistachios and different varieties of tea and much more.

The 62-m Galata Tower built by the Genoese in 1348, once the tallest building, now houses a popular roof-top restaurant, bar and nightclub. During the Ottoman era it was mainly used as a lookout tower for the fires that regularly swept the city. From the top of Galatta Tower, we had a panoramic view of the Golden Horn, the Bosphorus and the Historical Peninsula.

**FOODIE PARADISE:** The food is tasty as it is prepared from fresh ingredients and includes Mediterranean and Middle Eastern flavours. The Turkish love their tea as much as their coffee. We tried Gozleme, similar to pancakes, filled with Turkish sausage, spinach and cheese, or minced lamb. If you have a sweet tooth, don't miss the sticky-sweet baklava and Turkish delight (lokum) coated with fine sugar and stuffed with pistachios. And while in Istanbul, get yourself a meat-stuffed doner kebab at a street-side kebabci. ■

#### FACT FILE

**Getting there:** Turkish Airlines operates flights to Istanbul from various countries.

**Where to stay:** There are several five-star hotels like Hilton Istanbul with a view of the Bosphorus.

**Tips:** Visit a hammam for a scrub and come out clean.

**Have lunch at a waterfront restaurant, go on an Istanbul-by-night tour or an evening cruise on the Bosphorus.**

## In search of art and social change

Sidika Sehgal  
New Delhi

IN 1997, Khoj International Artists' Association began as an annual workshop with local and international artists with the intention of promoting experimental and unconventional art. Khoj now has a beautiful office space in Khirki in south Delhi. It supports artists by offering them a creative space where they can practise and, importantly, a space where they can fail.

Khoj's commitment to socially engaged art projects comes from the belief that art can inspire social change. "What can art do and what should it do?" asks Pooja Sood, one of the founding members of Khoj, reflectively.

Khoj encourages its artists to find a middle path between artistic practices and the approach adopted by civil society organisations to effect social change. Such projects lie at the intersection of many practices. Can something fruitful emerge if civil society organisations and artists engage with each other? Khoj believes so.

Delhi Loves Me? was one of their most successful socially engaged art projects. In 2005, when Delhi was undergoing a facelift in the run-up to the 2010 Commonwealth Games, Navjyot Altaf took to the streets and struck up conversations with locals in Khirki and Hauz Rani. They opened up to her about being pushed to the margins so that Delhi could be presented as a world-class city. She collected sentences and snippets from these conversations and made stickers which she then stuck on nearly 30,000 auto-rickshaws in the city. The name of the project, 'Delhi Loves Me?', is an inversion of 'I Love Delhi'. Khoj received numerous calls from people who told them what a wonderful initiative this was.

Sood is very clear that her idea of art is not for it to be peripheral to society. The kind of speculative art practices Khoj supports encourages artists to engage with the community. Radha Mahendru, senior curator and programme manager at Khoj, finds that an open-minded approach is very close to scientific research because it is based on empiricism. She believes that it's very dangerous if artists enter a community knowing what they are going to find and what the result is going to be.

In June 2019, Khoj gave out four grants of six lakh rupees each for socially engaged art projects that connect with issues of gender and urbanisation in peri-urban spaces through artistic intervention. Manjiri Dube, program coordinator, explained that



Left to right: Radha Mahendru, Pooja Sood and Manjiri Dube

MARC OHREM-LECLEF



Aryakrishnan R



Autos with Delhi Loves Me? stickers took the city by storm in 2005

peri-urban spaces lie at the cusp of rural and urban development, and thus studying the forces of urbanisation in such spaces is important. She said that urbanisation has particularly created problems for women and the LGBTQIA community.

One of the projects, run by Sumedha Garg and Nitin Bathla, is working in Kapashera, a formerly agrarian settlement at the cusp of Delhi and Gurugram. Over 300,000 migrant labourers from UP, Bihar and West Bengal have settled in Kapashera. There is almost no empty space in the settlement and as a result, it has no safe spaces for women and children. Garg and Bathla have rented an abandoned cloth factory in the locality and hope to transform it into a space where women and children can come together to interact and voice their aspirations and problems alike. The end result of this project is yet to be seen.

Princess Pea, another artist who received the grant, is planning to engage with young girls in rural Goa. Through a series of interventions, she wants to enable them to come out with their thoughts and talk about what they envision for

themselves. She plans to do this through a series of football sessions, given the binding value of sport. She also wants to develop a kit for the girls, with their help.

Aryakrishnan R plans to work with the LGBTQIA community in three locations in Kerala — Thiruvananthapuram, Thiruvalla and Angamaly. His work is inspired by the murder of transgender activist Maria in Kerala in 2012, who was also a close friend of his. Sweet Maria Monument: Queer Futures, Aryakrishnan's project, is an attempt to gather the queer community to talk about the future of the community and the politics within the community. He is planning his first workshop in Angamaly at the moment.

Sumona Chakravarty and Nilanjan Das are working in Chitpur, an old red light area in Kolkata. Their work is centred around understanding the design of public spaces. Where do sex workers solicit clients? Where do young couples meet? Where do men collect to play cards? Their work will focus on creating engagement around peripheral, gendered spaces and finally attempt to create safe

SHREY GUPTA



Sumona Chakravarty and Nilanjan Das

**'Socially engaged art practices must not just have a film at the end of it. The end result of the project must be realised in the community.'**

spaces for women without affecting their sex work.

Over the course of the year, the Khoj team will play the role of guide and friend for the artists. They will observe their process, gather notes and try to make sense of all the evidence. The insights drawn can be a learning resource for artists in the future. Khoj is also planning to organise a seminar for the artists to come forth with their research. The hope is that it will be an opportunity for civil society organisations and artists to learn from each other.

Khoj sets a wonderful example by being open-minded in the way they selected artists. "Faith is very important to us," Mahendru says. When they called for applications for the grant, they asked open-ended questions in order to understand what the artists thought about the idea of a socially engaged art practice. They made it clear that it was not a production grant for documentation—socially engaged art practices must not just have a film or an installation at the end of it. The outcome of the project must be realised in the community and with the community.

However, in a community-based art project, it's very easy to jump over to the other side and function like an NGO. But Dube clarifies that Khoj is not that. The artists work closely with the art practice and it is the process which becomes the artist's work. An art practice that engages people is very meaningful. While a sculpture has its own artistic and aesthetic value, it doesn't interact with the community, Manjiri emphasises.

Sood believes that if art has the power to change, it must be put out for the community to interact with. This is a fairly democratic idea of art, far removed from the idea of art for art's sake. Accessibility to art is an important concern for her. "We're between the market and the museum. That's where we position ourselves." By supporting these four artists in their work, Khoj is helping bring the museum onto the street. ■



**AYURVEDA  
ADVISORY**  
Dr SRIKANTH

**Kidney health**

**F**OUR risk factors increase the possibility of an individual developing kidney disease. These are: diabetes, high blood pressure, cardiovascular disease and a family history of kidney disease, diabetes or high blood pressure. However, you can protect your kidneys by preventing or managing all these health conditions.

**PREVENTION:** Always choose healthy foods — fresh fruits, fresh or frozen vegetables, whole grains and low-fat or fat-free dairy products.

Drink plenty of fluids (1.5 to two litres of water daily). But do remember that fluids in the form of colas, coffees and carbonated drinks are not a good substitute for water.

Some teas and juices may contain vitamins and minerals that are helpful for the kidneys. However, they may also contain high caffeine content or sugar, which can be harmful to the kidneys. Water is the best drink.

Cut back on your intake of sugar and sodium. This means avoiding all processed and junk foods.

Cook with a mix of spices instead of salt and try to consume foods with little or no added sugar. Consume fat-free (skimmed) or low-fat milk and milk products. Try to eat foods without gravy or added fats.

Eat foods made from whole grains — such as whole wheat, red rice and whole-grain corn — every day. Use whole-grain flour for chapattis and substitute red rice for white.

Barley is an excellent grain for cleansing the kidneys. This whole grain is not a cure, but it can be used with other methods to maintain optimum functioning of the kidneys.

Soak a handful of barley in about 200 ml water at night. Filter and drink the same water first thing in the morning. Include barley instead of refined flour in your diet. You can also boil a fistful of barley in about 250 ml of water till it is cooked well. Filter and drink the water, twice daily.

It is believed that fruits and vegetables that are rich in potassium aid in cleansing the kidneys. Fruits like grapes, sweet lime, oranges and bananas are all rich sources of potassium. Milk and yogurt are also good sources of potassium. Including these foods in your daily diet helps maintain the level of electrolytes in your blood, which keeps the kidneys functioning at their optimum.

But avoid excessive intake. Remember, one must have a balanced intake of potassium-rich food. A healthy person can have up to 4.7 gm of potassium per day.

Always make it a habit to read food labels. Choose foods low in saturated fats, trans fats, cholesterol, salt and added sugars. Aim for less than 2,300 mg of sodium each day.

Slow down at snack time. Eating a pack of low-fat popcorn takes longer than eating a *samosa* or a slice of cake. Peel and eat an orange instead of drinking orange juice. Avoid/reduce intake of caffeine, chocolate, nuts and processed foods as far as possible.

Try baking or broiling meat, chicken, and fish instead of frying.

Keep a written record of what you eat for a week or opt for a mobile app. It can help you control yourself when you overeat or consume foods high in fat or calories.

**ADDITIONAL TIPS:** Be physically active for 30 minutes or more, on most days.

Aim for seven to eight hours of sleep each night. Stop smoking, quit drinking and control your weight.

If your kidneys are not performing normally, you can develop symptoms like swelling in the legs, nausea, fatigue, weakness and insomnia. The

following complaints may seem vague, but need to be investigated to rule out kidney disease:

Difficult, painful urination, foamy urine, dark urine, increased thirst, increased need to urinate (especially at night), puffy eyes, and swollen face, hands, abdomen, ankles or feet.

As most people with early kidney disease will have no symptoms, early testing becomes quite critical. So always get a regular annual health check-up done.

The incidence of drug-induced nephrotoxicity has been increasing with the rise in the number of drugs and the easy availability of over the counter (OTC) medication. If you take OTC painkillers, like ibuprofen daily for pain or joint swelling, do get your kidney function tests done at regular intervals. These drugs can cause damage to the kidneys if taken too often, over a long period.

**USEFUL HERBS:** Punarnava can be used daily to keep kidneys healthy.

Gokshura is a wonderful herb for treating urinary tract infections and burning sensation during urination. It boosts kidney health and is beneficial for those who suffer from recurrent urinary tract infections as well as recurrent renal stones.

Manjishtha supports kidney cleansing. Gokshura, punarnava and manjishtha are available as tablets (Himalaya). One tablet, twice daily, is useful as a health supplement for individuals with risk factors.

Coriander helps in reducing burning micturition. Boil one teaspoonful of dried and crushed coriander seeds in 150 ml of water for about 10 minutes. Filter and drink this infusion, twice daily.

Methi (fenugreek) seeds have been used by traditional herbalists for kidney problems. Consume half to one teaspoonful of powder, twice daily. ■

*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**

**Paper craft**



THERE is life after death for old newspapers. Craft City, a social enterprise, turns discarded newspapers into attractive and durable baskets, lampshades and photo-frames. Take your pick from laundry baskets, cylindrical baskets, fruit baskets, pen holders, bowls and boxes. There are also table lamps, vertical lamps and round lamps which illuminate your room with a gentle light.

Craft City was started in 2017 by Eshaan Kamdar, a computer engineer and management graduate. He says it was his sister, Aditi, who was making products from newspapers after working out techniques and designs. Eshaan converted Aditi's hobby into a social enterprise,

adding new products and marketing inventively through exhibitions, architects and event managers. Mumbai, Delhi, Raipur and Bengaluru have emerged as promising markets.

"The lacquer we use is water resistant and gives our products strength and durability. The colours are organic. The process is eco-friendly," explains Kamdar.

His small unit employs 11 people. Part of the manufacturing process is outsourced to home-based workers in slums and a village on the outskirts of Nagpur. "If they work well we include them in our core team," says Kamdar. Craft City's products are recognised by the Ministry of Handicrafts. ■

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