

## SCIENCE CITY DONE IN BY POOR SCIENCE

By Nirad Mudur, Bangalore Mirror Bureau | Jul 6, 2016, 04.00 AM IST

*Authorities constantly ignored scientific advice while planning for Bengaluru*

Call it vain arrogance on the part of civic agencies, but that is what went into the haphazard planning of Bengaluru by blatantly ignoring scientific reason despite an active presence of a plethora of scientific institutions based right here in the city.

Civic agencies repeatedly turned away their faces from sound scientific guidelines and reason presented by various scientific institutions in the core fields of food, water, air, transport and city planning.

The threatening consequences - which brings us to the point of asking, 'How much time are we left with to sustain ourselves in Bengaluru?' - is there for all to see.

TV Ramachandra, coordinator, Energy and Wetlands Research Group at the Centre for Ecological Sciences, Indian Institute of Science (IISc), informed Bangalore Mirror that bureaucrats ignoring scientific counsel has ended up in city's urbanisation shooting up a whopping 1005 per cent between 1973 and 2016; and the unregulated growth now projects a threatening 93 per cent of Bengaluru's landscape to be filled with paved surfaces (or urban cover) at the cost of open spaces and green cover alongside higher air pollution and a sharp decline in water table by 2020.

"This is bound to make the city greenhouse gas-rich, water-scarce, non-resilient and unliveable, depriving the city dwellers of the basic constitutional rights - the right to clean air, water and environment," he said.

### SOLUTION IGNORED

Several appeals by Ramachandra to Bangalore Development Authority (BDA) and other authorities concerned to desilt the city's lakes fell on deaf ears. This, despite showing earlier shining examples such as Jakkur Lake where desilting, followed by setting up a sewage treatment plant (STP), a constructed wetland and an algae pond, helped revive and maintain the lake.

And desilting itself holds multiple benefits: The slush and sand removed as part of desilting is estimated to value a total of about Rs 15,000 crore, which can be a revenue source as slush can be a good fertiliser due to its nitrogen-, phosphorous- and potassium-rich nature, while the sand can be utilised in construction.

The BDA has 123 lakes scheduled for rejuvenation. These lakes have the potential to hold a total of 30 thousand million cubic (TMC) feet (about 84,950.53 crore litres) of water.

"But first, we need to desilt these lakes! But the bureaucracy does not want desiltation to be carried out," he said.

Tests carried out by Ramachandra's group on 105 lakes showed they had a total storage of 7-8 million cubic metres of silt and 6-8 cubic metres of slush. Once this was cleared, 30 TMC of water could be totally stored annually in the lakes as vibrant water bodies of the city. Moreover, another 15 TMC of water can be stored by citizens resorting to rainwater harvesting technologies throughout the city.

Let alone following guidelines suggested by experts, field studies in 2015-16 of these lakes revealed that 98 per cent were encroached upon for constructing illegal high-rise apartments, commercial buildings, slums, etc, and 90 per cent were sewage-fed, Ramachandra said.

"Lake catchments are being used as dumping yards; and indiscriminate disposal of solid and liquid waste has increased the nitrate levels in the groundwater of areas nearby. This is threatening the health of residents with diseases such as kidney failure and cancer," he said. "The water table has declined to 300 metres from 28 metres, and 400-500 metres in intensely urbanised area such as Whitefield, over a period of 20 years," he said.



## RED OVER GREEN COVER

Quantification of trees using remote sensing data in the Bengaluru region, complemented with field studies, have shown that the city has a total of 15 lakh trees for a population of 95 lakh - one tree for seven people. But for a healthy city environment, the numbers need to be reversed - seven trees of each person.

"The present numbers are far insufficient to remove the daily respiratory (exhaled) carbon," said Ramachandra.

Sadly, not only are the trees too few in the city to ensure a healthy environment, but the few that stand threaten life and property during heavy rains.

Surendra Kumar, director, Institute of Wood Science and Technology (IWST) told BM that even when trees get uprooted across the city, "the BBMP officials have never considered approaching us despite our institute being the only one of its kind in the city ready with technology to identify trees that can withstand high winds and rain, and those that cannot".

Kumar is planning to introduce tomography to screen the health of trees in the city, each machine costs about Rs 15 lakh. IWST is looking at procuring three tomography machines.

The technology images sections of the trees using x-rays to look for hollows caused by parasites. Raintrees and gulmohars - which abound in Bengaluru - are especially at risk of getting uprooted during heavy rain if they are attacked by parasites. But they deceptively remain standing until then.

"First, we want to develop a protocol on what kind of trees can be targeted for this technique; only then can we involve the BBMP for men and resources. But the civic body can be a hard nut to crack in such circumstances. They have been indifferent at best towards tree damage," he said. The lack of proper health screening of trees using adequate scientific resources available through institutes such as IWST in the city has had its adverse effects. Surface and atmospheric temperatures have increased due to loss of trees and water bodies. And this is made worse by an increase in artificial material having high heat conductivities being used in construction. Ramachandra said the average temperature has increased by 2-2.5 degrees Celsius in the past three decades.

## WASTED EFFORTS

Transportation Engineering Lab (TEL) of the civil engineering department of IISc had submitted two guidelines/designs to solve two major problems in the city. There were: public transport solution involving development of exclusive bus lanes from Majestic to ITPL, and designating footpath zones for street vendors. But neither was taken up seriously by the Directorate of Urban Land Transport, Bangalore Metropolitan Transport Corporation, or the BBMP.

Ashish Verma, assistant professor at TEL said that with the aim of encouraging people to take public transport on longer distances within the city, his team had designed a systematic exclusive bus lane from Majestic to ITPL. "However, after a hint of initial interest shown by bureaucrats, there was no further reaction to this proposal which remained as a blueprint," Verma said.

The design for street vendor-exclusive zone on footpaths too went the same way. After taking into consideration various parameters of footpath encroachment, Verma and his team calculated separate widths of footpaths that could be set aside for street vendors. "We submitted the designs on effective footpath width-sharing to the BBMP, and also sought appointment with the BBMP chief to put across our views, but we were never given one. We had carried out studies in six different areas, and I insisted that they implement it on a trial basis in at least one of them, but nothing happened," he said.

"The decisions are mainly taken by bureaucrats and politicians with no scientific backing. In the USA, city transport departments are constantly in touch with universities to seek scientific solutions for problems. That is not happening here." Verma said.

When asked whether science had failed Bangalore in its growth, Ashwin Mahesh — a driving force behind numerous urban development projects in Bengaluru, and who was a part of the Agenda for Bengaluru Infrastructure and Development Task Force — said: "Not at all! What it shows is how science and technology have been learned and developed in ways that are not integrated into society and, therefore, the benefit of our scientific capabilities is largely not felt in the public arena. We need a more immersed culture of knowledge development in which applied learning, especially that which is applied for solving public problems, gains prominence."

## GALLERIES



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