



# “Next Generation will Have To Pay A Heavy Price”

*Dr. T.V. Ramachandra is a well known environmentalist and scientist at the Indian Institute of Science, Bangalore. His research report focusing on deforestation and urbanization of Bangalore that were posing a big threat to the environment made news recently. Here in an interview given to Science Reporter, Dr. Ramachandra shares his views with SAUMYADIP SARKAR on Bengaluru's rapid and unplanned urbanization, the dire need to protect urban wetlands and for planners and administrators to have a futuristic outlook with respect to natural resources.*



**Saumyadip Sarkar:** *Dr. Ramachandra, how did you grow up to be an environment lover and how did your parents or teachers influence you throughout your career?*

**T.V. Ramachandra:** Though I was born and brought up in an urban environment, I had opportunity to spend holidays in the Western Ghats with my grandparents and other relatives. Interactions with native forests and pristine water sources and more importantly the very sensible native population have shaped my career path. The pristine nature and sensible

and knowledgeable elders helped in moulding my personality. My school teachers (mathematics and biology) have also certainly played a role in shaping my career.

My teachers apart from giving me opportunity to be the class leader (monitor), also gave me the responsibility of taking special classes (for my classmates, who were sluggish in studies) in the evenings. This gave me an opportunity to understand the role and responsibilities of a teacher at a very young age. This assignment also made me disciplined. Probably, this also

helped in improving my reading habits especially science magazines.

**Saumyadip Sarkar:** *How do you define sustainability and how can administrative reforms influence sustainable practices?*

**T.V. Ramachandra:** Our constitution empowers citizens through decentralization of power, effective people's participation through state and non-state mechanisms, greater synergy and consolidation among various agencies and programmes of government, civil service reforms, transparency, rationalisation of

governmental schemes and mode of financial assistance to states, improved access to formal justice system to enforce rights, reforms and strengthening of land administration and harnessing the power of technology for governance.

However, policy-making takes place at the centre (macro-level), and the actual implementations at the end-user (micro-level) by the bureaucrats/administrators are mostly different than what was originally conceptualised or intended for. This leads to economic inefficiency, ineffectiveness and inappropriateness of some of these set-ups.

**Saumyadip Sarkar:** *So, what do you propose?*

**T.V. Ramachandra:** In a rapidly urbanising economy with fast technological changes there is a need for governments to quickly and continuously 'adapt' to these changes through enabling technologies for ensuring a smooth and sustained workflow through interactions with the government and the people.

**Saumyadip Sarkar:** *How would you rate, on a scale of 10, environment conservation in Bangalore?*

**T.V. Ramachandra:** Two out of 10. I am disappointed with the lukewarm response of decision makers, not taking suggestions based on scientific data in the decision making.

**Saumyadip Sarkar:** *Could you share your recent research on "Modelling Urban Revolution in greater Bangalore, India".*

**T.V. Ramachandra:** Bangalore's unrealistic growth is an eye opener for any sensible Indian. Our next generation will pay a heavy price due to the mistakes of the current generation. Bangalore is experiencing unprecedented rapid urbanisation and sprawl in recent times due to concentrated developmental activities with impetus on industrialisation for the economic development of the region. This has led to large scale land cover changes with serious environmental degradation, posing serious challenges such as climate change, enhanced greenhouse gas (GHG) emissions, lack of appropriate infrastructure, traffic congestion, and

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lack of basic amenities (electricity, water, and sanitation) in many localities, etc.

Urbanisation from 1973 to 2016 (100% concretisation or paved surface increase), has had telling influences on the natural resources such as decline in green spaces (88% decline in vegetation), wetlands (79% decline) and sharp decline in groundwater table. Geo-visualisation of land use during 2020 through multi-criteria decision making techniques reveals that 93% of the Bangalore landscape will be filled with buildings, etc. This would make the region GHG rich, water scarce, non-resilient and unlivable, depriving the city dwellers of clean air, water and environment.

**Saumyadip Sarkar:** *What are your views on energy conservation and waste treatment?*

**T.V. Ramachandra:** Well, there are many technically feasible, economically viable, socially acceptable and environmentally sound options. For example, the country's landscape is blessed with abundant solar energy and bioenergy in addition to ample youth power. We need to harvest renewable sources of energy in a decentralised way to address the energy scarcity while enhancing job opportunity to our youth. An example is the implementation of generation-based incentive schemes in Karnataka; rooftops are gradually transforming into energy generators in a decentralised way.

Regarding waste, our studies reveal 72-75% is organic in household which constitutes a major fraction in Municipal solid waste. On an average each family generates about 800 to 900 gm of waste every day. This fraction can be converted to either energy or compost (if lignin content is high) through appropriate technologies. However, due to mismanagement organic fraction is

getting mixed with other fractions posing serious challenges. So segregation is necessary.

**Saumyadip Sarkar:** *The water crisis in many parts of the country does not augur well for the future. Your team has come out strongly against encroachment and commercialisation of urban wetlands. In fact, you have even gone to the extent of suggesting that builders and developers who have destroyed the wetlands of Bangalore should be thrown into the Arabian Sea. How strategically important do you think could be wetlands in taking care of the water crisis that faces us every now and then?*

**T.V. Ramachandra:** Wetlands play a pivotal role in ensuring the water security and also aid in remediation and aptly often known as 'kidneys of the landscape. Our study shows that groundwater table in the region gets altered with the removal of wetlands (lakes), evident from the decline to 300-400 m from 100-200 m (in the presence of wetlands).

Similar studies done in Western Ghats confirm the role of marsh lands, swamps in retaining the water. The aquatic ecosystems, with a good native vegetation in the respective watershed region help in sustaining the water, which supports and sustains peoples' livelihood.

Considering the looming threat of water scarcity due to mismanagement of natural resources, I strongly feel all violators whose action certainly deprive our future generation of basic needs (water, etc.) are to be punished without any mercy. Let us be stringent, if we are concerned about our country's future as well as welfare of our next generation, we need to implement environmental norms to safeguard ecosystems.

**Saumyadip Sarkar:** *Shouldn't the Chennai floods have been a wake-up call for authorities to realise the sanctity and importance of conserving and nurturing wetlands?*

**T.V. Ramachandra:** High quantum of rainfall is the indication of changes in climate (due to global warming) and higher loss of life and property, highlights mismanagement of natural resources due to inefficient and incompetent decision makers with the removal of interconnectivity and marshlands (due to unauthorised occupation/encroachments). We need to make decision makers accountable for all human-made calamities. Due to the short-term goals of this section of the society, the country and people pay a heavy price. Decision makers need to have a vision of sustaining natural resources than optimising proceeds during their professional career. Chennai, J&K and Uttarakhand floods are certainly wakeup calls for all sensible citizens of our country. We need to intervene and reverse the damages due to illogical and senseless unplanned activities.

**Saumyadip Sarkar:** *How do you propose reinvigorating wetlands throughout the country? Are the current rules and regulations enough to prevent the wetlands and other water bodies from being appropriated and mauled by vested interests?*

**T.V. Ramachandra:** Unfortunately, the next generation will have to pay a heavy price (our children will not have water – quality and quantity) for the irresponsible acts of the current generation in allowing abuse of ecosystems (such as wetlands, etc.). Threats to wetlands are: (i) too many para-state agencies and fragmented or un-coordinated governance, (ii) poor or inefficient regulatory mechanism, and (iii) nexus of bureaucrats, politicians and mafia (land, water and waste).

The rejuvenation of lakes/wetlands will involve mapping of wetlands boundary and flood plains; demarcating buffer zone (75 m ) with regulated activities; allowing only treated sewage into the lake; integration of sewage treated plants with constructed wetlands and algae ponds (this would ensure the



removal of nutrients in treated water). This model is working satisfactorily at Jakkur lake in Bangalore.

**Saumyadip Sarkar:** *You have also highlighted the importance of conserving the Western Ghats. How can a balance be achieved between the 'need' or yearning for development and the necessity of conserving natural habitats?*

**T.V. Ramachandra:** Well, Western Ghats constitutes only 2.5% of land mass but provides water and food security to the entire peninsular India. We have earmarked eco-sensitive regions in Western Ghats to be conserved for posterity. There are large scale encroachments in Western Ghats. The presence of rubber plantations in erstwhile dense evergreen forest regions highlights the level of encroachment (which ranges from 30-40% in each taluk of Western Ghats districts). I suggest that the government should carry out digitisation of land parcels and make available this information to all. This helps in curtailing further encroachments and also to take immediate action against big violators of nature.

**Saumyadip Sarkar:** *How has geospatial technology come to the aid of environmental warriors such as you in today's time and age?*

**T.V. Ramachandra:** Geospatial technologies (temporal remote sensing data with geoinformatics) have helped in understanding the landscape dynamics (linkages of land cover, hydrology, biodiversity and ecology) and visualisation of likely changes. This has helped in convincing sensible decision makers the need for sensible development while sustaining the natural

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resources. Our work in the Western Ghats, brings out the implications of poor planning in ecologically sensitive regions. We need to question decision makers who allowed contamination of the Ganga River (in the name of development) and during the last four decades successive governments have to spend lot of public money to rejuvenate it. The recent announcement of Rs 20000 crores to clean Ganga (Namami Ganga), further highlights that it is economical not to contaminate (controlling pollution at source) than contaminating and then spending public money to decontaminate.

**Saumyadip Sarkar:** *Thanks a lot Dr. T.V. Ramachandra for your wonderful words. Would like to say a few words for the readers of "Science Reporter"?*

**T.V. Ramachandra:** Let us communicate effectively the tenets of science, taking advantages of technological advances and make every child in India responsible and knowledgeable so that our motherland benefits from the immense knowledge of the responsible youth force (who constitute a major fraction of our society).

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