

Water crisis in India

The article by Soni¹ on the crisis of water resources in Delhi reminds me of another dimension to the problem. My comments are based on anecdotal knowledge of water resources in rural Kolar District, Karnataka, but discussions with a few experts have revealed that they apply more generally. In any case, I regard the problem as urgent and immense in magnitude.

The tanks that stored water from monsoon rainfall, mostly for wet cultivation, became a thing of the past when electric pumps started extracting water from underground, often with government loans and subsidized electricity. This enhanced farmers' incomes and turned India from a food importer into an exporter. However, the new mode of operation produced an unintended outcome: local wells that yielded water at 10 m depth in the 1960s became completely dry by the 1990s. Farmers whose water supply was plenty

at one time, had none as soon as a neighbour dug a well that was only a few metres deeper. I know farmers who had to dig a few times deeper over the years to maintain their access to groundwater. The sediments accompanying the deep groundwater often modify the surface soil adversely. Altogether, this appears to be a precursor to a looming disaster.

Water management is a local issue (on the scale of a state or a few neighbouring states, sometimes on the scale of a few Districts) and no solution can be expected to apply uniformly across the country. One control lever is planning. The increasing industrial demand for processing water and the tendency of farmers to opt for water-intense crops has caused acute demands; it is thus clear that water management must receive appropriate priority in planning. The other lever is conservation. One does not wish to return to exclu-

sive dependency on monsoons, but it is necessary for each state to examine how to conserve its water resources and think of local solutions. While the problem has been clear for some two decades even to bystanders like me, no solutions seem to have been implemented. Indians should be especially aware that large shifts in water resources have wiped out civilizations over time (e.g. the Harappan civilization).

1. Soni, V., *Curr. Sci.*, 2007, **93**, 760–761.

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Should scientists be proactive?

The judiciary in the country is often considered to be quite proactive, particularly in matters of societal (public) interest. Although expenditure for its function, logistics, etc. comes from the budgetary allocation by the government, it draws its primary power from the compendium of 'rules or principles' called the Indian constitution. Basing its rulings purely on available 'evidences', it follows the 'law' and not necessarily the official (or government) line of thinking. Understandably, this 'proactivity' has remained a matter of debate, having both its protagonists as well as opponents.

This case seems to be similar to that of the scientists who also obtain their salaries, laboratories, equipment and all other logistics and requirements mostly from the government treasury. And the power of scientists is also derived from the totally unbiased (or purely objective) application of 'scientific laws/or principles' to necessary and sufficient hard facts (or data). In most cases of social interest, i.e. areas where science and society need to meet and interact, one finds surprisingly that, unlike the judiciary, scientists and various scientific academics prefer to, remain silent rather than enlightening about what scientific work needs to be done or

how it has to be scientifically evaluated, etc. It appears that they like to remain as lotus grown out of our social muddiness.

In a developing set-up like ours with our large population, poverty, quality of life, level of literacy, medicare, scientific awareness, etc., there are a number of problems where close interaction between science (or technology to be more appropriate) and society is essential. For example, the short and long term energy needs, drinking water problem, pollution, waste disposal (including nuclear), disaster management, continued development/improvement of need-based technology for our social milieu, especially for the non-metro and non-urban sector are some areas of concern. But one does not find enough discussions (by scientists or academics) of possible vision, models, blue-prints and/or action plans on these issues of direct social relevance; if they take place, these are perhaps out of the public domain. Of course, each year a scholarly and erudite analysis of issues of deep social concern is presented in the address of the President of the Science Congress in the presence of the Prime Minister, but one does not know what effective follow-up by different concerned scientific laboratories/departments has been

taken up on societal problems. For want of sufficient actions, these expressions appear to be ritualistic and customary.

In the US, various expert scientific committees (covering issues of societal, scientific and technological needs) are set up by the American Association of Advancement of Science (AAAS) and different scientific unions. These groups prepare reports and possible action plans (of both short- and long-term requirements and perspectives) and present them before the members of the Congress, Senators, etc. to educate and make them aware. It is not known if our scientific academies will follow this effective and useful pattern. Let us consider two recent examples that of the nuclear deal and the 'Ram Sethu'. Barring a few senior politicians and journalists (who may have their own biases), one does not find – at least in public domain – enough scientific material or objective evaluations by concerned scientists or academics with respect to our short- and long-term energy requirements and its fulfillment by the nuclear energy, and the innovative challenges/opportunities offered by the energy crunch for our S&T in the first case.

Similarly, the archaeological, geochronological, geological, geochemical, geo-