

Do scientists also need money?

I am writing on a topic that is considered taboo in our scientific community, but at my ripe old age ridicule for starting a public debate on this topic will neither touch my heart nor my head. We are all the time talking hoarse that good students are not taking up science and many committees have made elaborate suggestions for attracting the best of the talents to science. Will we succeed? No. In our era, wealth was not the criterion for respect in the society. In those times we were taught that knowledge and education were the best achievements, and the most respected persons were teachers and scientists. But now, it is the era of material wealth. Success of a person is measured in terms of his wealth. Gone are the days of simple living and high thinking. Now those aspiring for a job

ask for the package. Those who have by mistake or compulsion strayed into science are from this very society. What are the options for our Ph D students? Going abroad and living the rest of the lives as second class citizens. There is a negligible minority of the successful ones and we feel proud about them. I was made to realize the importance of money for old age by my teacher. I have seen both days of scarcity and prosperity, therefore, I am competent to talk about it. Let us state frankly that the scientific community also needs money for a secure future.

How do we go about it? When every service sector is fighting for a higher salary scale, why are we quiet? Have we ever compared our promotion prospects with those of the bureaucrats? Do we have an association to fight for our cause?

Why do we do every additional job free, e.g. reviewing of projects sent by funding agencies, attending meetings with a meagre honoraria. Some actions have been taken, but they do not reach the majority. We will have to rationalize the salary package for the scientists. We believed in whatever our parents and teachers considered good for us. The present generation is wiser, more confident and clearly knows what it wants in life. Unless we pay our scientists well, we cannot attract bright students to science.

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Water woes

Time and again water disputes erupt on the Indian scene that give an impression of a fragile body fabric of the nation. The shortage of water is felt from village level to national level and crisis players try to gain maximum advantage of the situation, with the sole aim to impress that they are the best protectors of the concerned parties' interests, particularly the agriculturists class. Often problems are, at present, best addressed by short-term solutions or through judicial interventions or by mutual agreements. Natural supply of water, i.e. rainfall, remains fixed in a narrow band that cannot be enhanced by any foreseeable means and accelerating water shortage of usable quantity is a fact. The crisis is slowly deepening each year because of unhindered population growth both in rural and urban areas availing piped supply prone to leisurely consumption, industrial development, rise in standards of living and significantly change in agricultural preference for good return by growing high water-demand crops as well as progressively more area coming under irrigation. The last category is the largest consumer of water.

Such a scenario calls for best utilization of available waters or national water use and right policy based on the nation

as a whole, and every consumer has equal controlled rights of water use and without discrimination at any level by developing a national consensus. The immediate step towards this is to remove the belief regarding a water-surplus or a water-deficient regions; all regions are equal as far as water resource is concerned. The first step to tackle the problem is to draft the available water budgets at national level by the ministries of earth sciences, water resources and agriculture, taking into consideration surface and groundwater, so that every citizen should know the likely availability of water. The figures of availability could be worked out twice or thrice in a year at appropriate times and be released to the public for scrutiny and discussion, and consumer (industry, farmers, urban and rural) allocations. The country can be divided into a dozen or more regions based on geography, climate and agricultural practices and allocation can be made on the water-availability basis.

Agriculture is the main user of water and food supply is solely dependent on this sector of the national fabric. In the best national interest, the country cannot allow skewed development in this field. Presently, vocal farmers harvesting paddy,

sugarcane and wheat, are demanding huge volumes of water. They are relatively rich and corner a larger share of available water while poorer farmers belonging to crop failure areas where water supply is inadequate. Hence region-wise freedom of crop choice has to be regulated by determined national will, so that agriculturists of every region should get equal benefit from this precious natural resource. Since rainfall is unpredictable despite meteorological advances, the water supply policy can be framed for a block of 2–3 years, so that unexpected failure in one year could be compensated by the remaining period of expected supply. The region-wise turn of supply of water could be easily worked out scientifically. Initially, this would evoke a strong reaction from the rich farmers, but once it is accepted as a national resolve and when everyone sees a logic behind this, people will accept the reality. Water-saving irrigation methods should be firmly enforced so that wastage of water can be checked. The advantages of this framework would be that farmers will not depend on rainfall only and expected supply of water would be known to them in advance. They can plan, in a block of time, what kind of

crops can be raised from a basket of options in advance. Thus the country would have some sort of assurance of likely availability of food supply, with sound planning and mandatory number of crops to be raised in a year. Similar planning can be worked out for other water-consuming

sectors, e.g. further development of a mega city and water-consuming industry in a water-stressed region can be resisted and new urban centres be encouraged near water sources. Extravagant urban consumption and houses/residential complexes having tube wells should be heav-

ily taxed to protect the lowering water table.

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How technology advances and man decays

'Global warming' and 'climate change' have now become buzzwords. With the IPCC and Al Gore receiving the Nobel Prize for Peace, the message about the current situation has been communicated to the wider public and governments have also become more concerned about this problem and its implications. It is now recognized as a world threat, much more dangerous than nuclear wars.

Efforts are being made internationally to cut-off carbon emissions (as recommended by the Kyoto Protocol). Scientists are trying to develop new methods and techniques to reduce the emission of greenhouse gases (GHGs) leading to global warming. Different national and international, government and non-government agencies are working to spread awareness among the public about these issues, so that the living planet could be saved from further heating up.

But what if people, instead of reducing emissions of GHGs, release comparatively much more carbon into the air. No doubt, developing countries like India cannot follow strict guidelines for reducing carbon emissions. For the sake of their developmental needs, these countries need some concession in the capping of carbon emissions.

When tonnes of carbon are released for no genuine reason but for luxury and comfort, then it is not tolerable. I am talking about the carbon emissions in huge amounts from the intentional agricultural fires.

Earlier, man used to harvest crops manually, which took weeks or months to complete. With the advent of harvest-

ing machines called 'combines', harvesting of crops (cutting, thrashing and winnowing altogether) became easy and can be done within hours or days.

In the plains of Jammu province, even the small and medium farmers hire these combines from the neighbouring state of Punjab for harvesting crops, mainly wheat. This trend has continued for about the last ten years. There is no problem if farmers are using this advanced technology to collect their ripe crop spread over acres of land in a few hours. These huge machines can cut an acre of crop in less than half an hour. Moreover, it is economical and costs only Rs 500 per acre. On the other hand, the manual process may cost over Rs 3000. Then, why am I writing about it?

The reason is as follows. In the manual process of harvesting, there is no wastage or burning of biomass, and the straw or husk is also preserved for fodder and other uses. But these combines reap the crops by decapitating the plants and collecting only the ripe inflorescences, while the rest of the crop plants remain standing in the fields. These decapitated crops need to be cleared from the fields, so that the fields can be prepared for the next crop. Burning is the easiest way to clear the fields of the standing crop waste.

This way, thousands of acres of agricultural land are burnt here every year. Lakhs of tonnes of agricultural biomass (waste) are reduced to ashes, unleashing gigantic clouds of GHGs in the atmosphere. This is not only contributing to the avoidable addition of GHGs in the air and to global warming, but also to a re-

duction in the fodder availability for cattle. Such massive fires roast the agricultural soil up to a certain depth, thus killing the important soil flora and fauna beneficial for agriculture itself. It can also lead to destruction of agricultural biodiversity. Numerous insects, their eggs, larvae or pupae, seeds, tubers, rhizomes and eggs of birds get burnt mercilessly in such fires. These fires also burn the humus necessary for cultivation and growth of plants. It also reduces the moisture-holding capacity of the soil. Further, such agricultural waste could have otherwise been used for making paper, cardboard, as packaging material, etc. Such massive fires also burn the neighbouring wastelands or jungles, and plants and trees on the mads (bunds) and hedges. This causes a reasonable reduction in the production of oxygen by destroying the greenery.

India can go for carbon emissions as far as sustainable and genuine development is concerned. But the above-mentioned agricultural fires are not contributing towards this. Such an activity is a result of lethargy and a desire for luxury and comfort. In this scenario of global warming and the pressing need for reducing carbon emissions, can we afford such a luxury?

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