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Monitoring India's lifescape

I was pleased to read the article 'Deploying student power to monitor India's lifescape', by Madhav Gadgil (*Curr. Sci.*, 1996, 71, 688-697) and the painting on the cover page. The painting by Sanjeeva Nayaka was done extremely well. However, I noticed that Nayaka, for some reason or other, has missed out an important flying mammal of the order Chiroptera. These fascinating mammals known as 'bats' have existed even before pre-homosalien era. Inclusion of these creatures would have really completed the scenario on the cover page.

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Madhav Gadgil replies:

I fully share Krishnan's affection for the bats. In fact I enjoy nothing more than watching the swarms of giant fruit bats flying over the campus of the Indian Institute of Science every evening. However, I am also fond of bugs and beetles, wolves and whales. Unfortunately it is not possible to accommodate all these creatures in a depiction such as was attempted for the cover of the November 10, 1996 issue. Therefore, we had to be content with selecting just one organism to represent each phylum. An exception was made in the case of two major phyla, namely Arthropoda and

Chordata. For these we have representatives of the major classes as well. For mammals we chose a land animal—a deer, since the greater diversity of mammals prefers to walk rather than fly or swim. It was this logic that forced us to leave out bats. I hope that Krishnan would appreciate our dilemma and accept our apologies on behalf of the bats.

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Extramural research funding in India – An analysis for 1994–95

Of the 1557 R&D projects approved for funding to the tune of Rs 13133.76 lakhs by 16 Central Government departments/agencies during 1994–95, Bangalore-based Indian Institute of Science tops the tally with 64 R&D projects worth Rs 873.12 lakhs. Among the top 10 beneficiaries, Delhi alone has four such organizations (Table 1) which justifies its status as the R&D capital of India (*Curr. Sci.*, 1993, 65, 114–115). These data are contained in the latest

directory of extramural projects brought out by the Department of Science and Technology (DST).

Specifically, R&D projects in the disciplines of biological (25.43%) and engineering (24.73%) sciences together account for slightly over half of the total amount. Among various categories of institutions, the universities/colleges (233) received 57.23% of the approved projects. Interestingly, only 420 organizations and 14 individual scientists

shared these 1557 projects of 3–62 months' duration.

In so far as the funding profile is concerned, the DST ranks first amongst the 16 participating agencies (Table 2) both in terms of number of approved projects (458) and their total cost (Rs 4559.38 lakhs). Of these 1557 R&D projects, 721 received grants ranging between Rs 1 and 5 lakhs and only 70 projects figure in the category of Rs 25 lakhs and above. Of the four megaprojects costing

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Table 1. Top 10 organizations with number of projects and total approved cost during 1994-95

Ranking	Organization	Total approved cost in Rs lakhs	No. of R&D project(s)
1.	Indian Institute of Science, Bangalore	873.12	64
2.	OPTEL Telecommunications Ltd., Bhopal	407.50	1
3.	University of Delhi, Delhi	360.21	32
4.	Indian Institute of Technology (IIT), Delhi	348.23	36
5.	Indian Institute of Petroleum, Dehra Dun	346.61	2
6.	IIT, Mumbai	329.40	44
7.	Jawaharlal Nehru University, New Delhi	293.35	25
8.	All India Institute of Medical Sciences, New Delhi	258.06	32
9.	IIT, Kanpur	245.08	34
10.	Centre for Cellular and Molecular Biology, Hyderabad	238.69	6

Rs 100 lakhs and above, the Department of Biotechnology sanctioned two whereas DST and the Department of Electronics sanctioned one each.

While discussing its limitations, the directory puts on record that the Ministry of Non-Conventional Energy

Sources and Ministry of Environment and Forests did not furnish the list of projects for this endeavour. This is really sad. Hopefully, with the cooperation of all concerned, the future edition will provide a complete picture. It is high time that DST brought out a series

Table 2. Central Government departments/agencies which furnished the list of projects approved during 1994-95

Name of the agency
Council of Scientific and Industrial Research
Defence Research and Development Organization
Department of Atomic Energy
Department of Biotechnology
Department of Coal
Department of Education
Department of Electronics
Department of Ocean Development
Department of Science and Technology
Indian Council of Agricultural Research
Indian Council of Medical Research
Indian Meteorological Department
Indian Space Research Organization
Ministry of Water Resources
Ministry of Welfare
University Grants Commission

of publications highlighting the research output of extramural projects to mark its silver jubilee (1971-96).

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Dengue epidemic

The report on dengue hemorrhagic fever (DHF) epidemic in Delhi and the threat of yellow fever by V. P. Sharma (*Curr. Sci.*, 1997, 72, 10 and 1996, 71, 948) should be an eye opener to the Health Ministry and related governmental agencies. It certainly appears that this fatal viral disease (DHF) has come to stay and is likely to come back with more devastating consequences in the coming years. One logical reason for this will be as follows a) all 4 serotypes of dengue (types 1, 2, 3 and 4) have been involved in the previous 6 outbreaks in Delhi; b) population previously infected with any one serotype of dengue does not suffer from serious consequences, but when infected later with a different serotype, most likely suffers from the more fatal form of DHF which could lead to dengue shock syndrome (DSS). This was explained to be due to antibody-dependent enhancement (ADE) of viral infection (review by Halstead, *Science*, 1988, 239, 476)

which is known to occur in a number of flaviviruses to which dengue belongs. Hence a classical vaccine does not appear to be an attractive answer to control DHF. Instead, preventive measures for growth of *Aedes aegypti* mosquito are certainly the best immediate measures to control this disease. We need to learn lessons from the previous epidemics of dengue elsewhere. In Cuba, dengue epidemic occurred for the first time in 1977-78 in which 40% of the total population was infected with serotype 1 but a subsequent epidemic in 1981 due to type 2 virus resulted in DHF in which 1% of the total population (116,000) was hospitalized over a three-month period (Kouri *et al.*, *Bull. Pan Am. Health Org.*, 1986, 20, 24). Our country is definitely not geared to take up such an emergency involving even a fraction of percentage of population. In the Cuban epidemic, children were the most affected but in the Delhi epidemic even adults were affected which warns us

about the changing pattern of this disease. Apart from controlling the vector, there is an urgent need for a brainstorming session involving a cross section of expert scientists who need to act in a coordinated fashion. Instead, only a few individuals and institutes are working on shoe-string budget to battle this gigantic problem. We need to build a national resource of pathogenic organisms which need to be isolated periodically from endemic areas and epidemics and a comparative evaluation of the virus should be undertaken at the molecular level. Unlike the plague disease which at least can be cured by tetracyclines, this deadly viral disease has no such drugs. Until a clear national policy is evolved for controlling epidemics, we will be helping history to repeat itself.

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