Conserving the biodiversity of the Western Ghats as if people matter

This article summarizes Madhav Gadgil's proposal entitled 'Conserving the biodiversity of the Western Ghats: a participatory approach' for the Pew Fellowship. He welcomes suggestions, comments and participation by students and teachers of institutions, schools and colleges in the Western Ghat belt.

With the increasing realization of the consequences of the alarming rate at which the earth's natural resources are being depleted, conservation of biological diversity has become a major focus of attention. This concern is especially pertinent for tropical countries such as India, that are unique in being endowed with a rich diversity of flora, fauna and ecosystems.

A major problem, however, in the conservation movement has been the uncertain approach towards conservation by the state apparatus, often characterized by a lack of sensitivity in defining what exactly has to be conserved. For example, based on the suggestions motivated by the commonly held belief that any human activity is disastrous for the natural habitats, the Government of Rajasthan banned buffalo grazing in the Keoladea Ghana National Park, Bharatpur, with the intention of conserving the habitat for the migratory birds[1]. But a decade after the ban, the park habitat instead of improving, exhibits symptoms of deterioration with fewer birds visiting it. Clearly, buffalo grazing helped maintaining the habitat required for the waterbirds and it appears that when the grazing pressure was removed, the water cover in the park was choked by the rapid and unchecked growth of *Paspalum* grass, drastically affecting the habitat.

A number of such instances with disastrous consequences have evoked among the public a general opinion that the state apparatus has 'neither the knowledge, nor the motivation, nor the competence[1]' for conservation. Gadgil points out 'India's natural resources would be managed far better if we radically changed the process of managing them[2]'. The current centralized, bureaucratic approach has little detailed field information to back it up. More significantly it almost exclusively focuses on force of arms to keep people out of islands of biodiversity-rich protected area. Such narrow approach has clearly failed to deliver the goods. It has completely ignored the detailed locality-specific understanding of ecosystems of the local people, it has rejected their many significant conservation-oriented practices such as sacred groves[2,3].

Disillusioned by such futile attempts by the state apparatus, Gadgil is convinced that, 'We must reorient the whole effort to turn conservation into a people's movement, tapping their knowledge, supporting their traditions, creating incentives for them to conserve biodiversity in the modern context[3]'. After all, one of the greatest triumphs of modern conservation movement in saving the pristine rain forest at Silent Valley was entirely a people's movement powered by a voluntary organization, the Kerala Sastra Sahitya Parishat[1]. However, such movements may not always succeed as they are 'fraught with difficulties, for the people are poor and uneducated. Their traditional community-based institutions have been destroyed over the last two centuries[3]'.

What is the solution? Gadgil proposes that the problem could be solved by having a healthy interaction 'with institutions and segments of the society which are placed in a more favourable position[3]'. One of the novel and imaginative approaches in this regard has been his attempt to unleash the potential in the 'students and teachers scattered in the countryside[3]' and direct their interests to participate in the conservation movement. Following the imprint left by our colonial masters, 'students in both schools and colleges learn by rote some descriptive biology, with little contact with the rich plant and animal life so readily accessible to them. This apathy is a result of the fossilized system of which they are a part[3]'. It is in this context, that when the Karnataka Government approached Gadgil to assess the Western Ghats project in 1990, he suggested that the task can be best accomplished by students and staff of colleges located in the ghat areas. Following an orientation programme, students and teachers from as many as 28 colleges participated in field observations on components of development programme and conducted extensive interviews with local people as to their perceptions and aspirations. The report that eventually emerged has been highly acclaimed by the Government of Karnataka. The most important outcome of this exercise was that the students and teachers have been greatly enthused; in fact there has been a demand from them for 'more of such meaningful, relevant projects[3]'.

Encouraged by the success of such a pilot study, Gadgil now wishes to organize a participatory programme of undergraduate colleges working with people in their own localities to '(i) identify elements of conservation value, (ii) understand pressures from local communities as well as larger society responsible for the erosion of biodiversity, (iii) identify alternative patterns of resource use that would alleviate these pressures, (iv) identify community level as well as higher level institutions that would promote more

Pew award to Prof. Madhav Gadgil

Professor Madhav Gadgil of the Centre for Ecological Sciences, Indian Institute of Science, Bangalore has been conferred the prestigious Pew award under the 1993 Pew Scholars program in Conservation and Development. The award carries a grant of US $ 150,000 and is in recognition of his pioneering efforts in conserving the biodiversity of our country.

Gadgil proposes to use his Pew grant to 'organize a network of undergraduate colleges located in the vicinity of the Western Ghats to join hands with the local communities to work out a comprehensive, people-oriented strategy for conserving the biodiversity of the Western Ghats'.

environmental-friendly patterns of resource use, and (v) design a system of positive incentives that would make local people willing partners in conservation efforts[3].

It is hoped that 'such a project would be the beginning of a wholly new open, bottoms-up process of conservation planning as well as of reorienting the educational system to involve teachers and students in real life problems pertaining to the local environment, that would hopefully slowly cover other parts of the country as well[3].

1. Gadgil, M., *Biodiversity: Tapping Folk Knowledge*, *The Hindu*, January 10, 1993.
2. Gadgil, M., Involving people. In Managing our Natural Resources, Seminar 406, 14–18
3 Gadgil, M., in *Conserving the biodiversity of the Western Ghats: a participatory approach*, private circulation, 1993.

COMMENTARY

Student–faculty ratio at IITs and its impact

Pankaj Jalote

Currently all the five Indian Institute of Technologys (IITs) together produce less than 1500 B.Techs. every year. A conservative estimate is that 40–50% of these go abroad for higher studies (and most never return), 10–20% go in management, and 5–10% go in civil and other services, leaving a mere 500–750 B.Techs. for doing engineering in industry! A specific example will highlight this point dramatically. The IITs produce about 200 B.Techs. *in computer science, out of* which at most 50–100 join the computer industry. Compare this with the projected demand of over 30,000 software professionals by 1995 in the country to meet its plan on growth in IT industry and software exports! IITs produce only about 2% of the total number of engineering graduates produced per year in the country (appx. 70,000)!.

It is clear that with the current numbers, IITs will not make any significant impact on trained manpower needs of the country and consequently on industry as a whole, particularly in this day when the country is liberalizing and is poised for a major industrial growth. This will lead to loss of importance and marginalization of IITs in the national perspective, which will have many undesirable effects on the IITs, including loss or reduction in funding (signs of which are already appearing). This report shows that the low student-faculty ratio (S/F ratio) is a central reason behind this, and the one clear way to maintain the preeminence of IITs is to *produce a much larger number of highly* qualified engineers to satisfy the demands of a growing economy, at a much lower cost

S/F ratio at IITs and comparison with USA

In an IIT, typically about 250 B.Tech.s (not counting students of sciences and maths) and 250 M.Tech.s are graduated each year. An IIT has of the order of about 200 engineering faculty (with a total of about 325 faculty). This means that only appx. 1.2 B.Tech. and 1.2 M.Tech. is graduated per year per (engineering) faculty! Or overall the S/F ratio at an IIT (including all B.Tech. and M.Tech. students) is only about 8, i.e. in an IIT there is 1 (engg.) faculty for every 8 (engg.) students!

One cannot compare these numbers with those existing in other universities in India or even other engineering colleges, as the nature of IITs and their focus is different. However, comparison with engineering institutions in USA definitely makes sense as IITs and these institutions have similar approach to education and R&D. To put the output of IITs in perspective, a survey was conducted of some of the major state universities in US. The name of the university, size of the engineering faculty, number of engineering graduates each year, *and number of engineering Masters* per year is given in the table

As can be seen from this table, on an average 3.5 Bachelors and 1.4 Masters are graduated per year, per (engg.) faculty in these universities. And this is for the universities which are among the best state universities in USA offering a very high quality education Furthermore, these universities produce a higher number of students per faculty despite the fact that their primary focus is not on teaching – a major part of the faculty's time is spent in R&D activities and the R&D output of these universities is very high. These numbers are much higher in many other state universities, which place lesser emphasis on research than the universities listed above.

Need to increase output of IITs

In India there is a vast difference in the quality of education imparted at IITs (and similar institutions) and other engineering colleges. Undoubtedly, one of the primary factors for this difference is the high quality of the faculty IITs have been able to attract (most having Ph.D.s from prestigious institutions across the world). Furthermore, in India, unlike in the US, there is an acute shortage of well qualified faculty for engineering disciplines and perhaps the most critical resource today for engineering education is qualified faculty. Given the difference in quality of faculty, it is unlikely that other institutions can produce the high quality of engineers and technologists that IITs can produce. And new institutions cannot be started for this due to the shortage of well qualified faculty. Therefore, perhaps *the only way to increase the availability* of highly qualified engineers and technologists in the country is to dramatically increase the output of IITs.

Given this situation in the country, it is clear that IITs should be producing even more than the average production per faculty in the universities listed above. This will mean that each IIT should be graduating 4-5 B.Tech.s and 2–3 M.Tech.s per year per faculty That is,