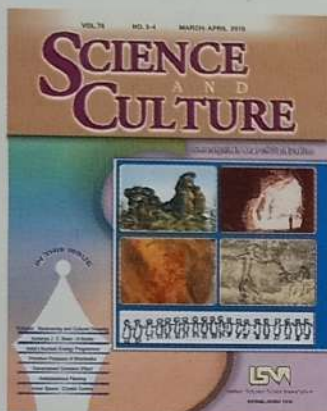


# SCIENCE AND CULTURE

VOLUME 76 □ MARCH-APRIL 2010 □ NOS. 3-4

EDITORIAL

## BIODIVERSITY AND CULTURAL DIVERSITY



I recently attended an excellent seminar on “Biodiversity and Food Security” organized by the Indian Science News Association. Being a physicist by training, it was a valuable learning experience since I only had a vague idea about biodiversity. During the seminar it occurred to me that there are many loose

ends and many unanswered questions on the subject that I would like to share here.

Biodiversity, a shorthand form for biological diversity, is not just an umbrella term covering nature’s full set of species, genetic variation within the species, ecosystem that contains the species and their interdependence for the whole system to survive—indeed, it is far more complex. Understanding and protecting biodiversity requires shared knowledge from different disciplines, ranging from anthropology to biology, sociology to economics.

The world we occupy today is very different from what it was a thousand or even a hundred years ago. We speculate that the world our children will inherit will be even more crowded, more polluted and less habitable than it is currently. A change in global environment (which includes climate change and changes in stratospheric ozone content among others) is now known to be primarily due to ever increasing human activity which affects the earth’s natural biophysical processes that maintain the condition to sustain life on earth. Closely related to this global environmental change is the loss of biodiversity, which includes loss of species, populations and their habitat. Although erosion of biodiversity is a natural evolutionary process, its rate of decline over the last

century (between 100 to 10,000 species per year) is astronomically large when compared to 1 to 10 species per year as estimated by palaeontologists considered as the background rate. Environmentalists believe we have already lost a wide range of biodiversity and that we cannot afford to lose any further. It is difficult to estimate the precise number of species we have lost so far, for the simple reason that we do not have a reliable count of all species that presently inhabit the earth!

There is no doubt that biodiversity is an environmental asset which is under threat. But why is there a need to conserve biodiversity? There is neither an obvious nor widely accepted reason. However, we can justify the conservation of biodiversity based on its utilitarian value. This includes food, fuel, medicine and other forms of basic materials needed to survive; pollination, nitrogen fixation, carbon storage, recycling and forms of services needed for our sustenance; genetic engineering, science, applied biology in the form of information; and the enjoyment of nature’s aesthetic beauty, devotion and religious inclination, recreation and tourism to satisfy our psychological and spiritual needs. Therefore conservation of biodiversity is essential for our survival on earth. One may argue the need for conservation of biodiversity *vis-à-vis* nature as it is, since beauty and spiritual satisfaction are subjective and personal.

An obvious question that arises here is “do we really need to conserve *all* biological diversity”? It is true that we do not know the full biodiversity of nature. A vast majority of species are still unknown with respect to undiscovered food value, medicinal property and genetic diversity. More than 20,000 edible plants are known and from history we know that only about 3,000 have been used by mankind and the world’s food supply is predominantly provided by much fewer plants and a handful of crops. The answer to the question that I posed above is an emphatic ‘we do not know’. In fact the intricate

relationship between biodiversity, productivity, ecological complexity, stability and environmental health is very complicated and not well understood. The relationship being fully known, philosophers argue with awe that each and every species of nature is useful and are dependent on each other. Another school of thought claims, perhaps out of deep reverence to nature, that each of nature's creations has an equal intrinsic value and nature will take revenge if any harm is caused to it. The situation can easily be described by a common 'pop rivet' analogy: how many rivets can a financially strapped airline remove from its aircraft without impairing flight safety? While all the rivets are probably not needed by the aeroplane, nobody wants to take a risk by removing some of them. Similarly in the case of nature, one can argue for the preservation of all species and habitats.

Is it worth making an attempt to generate (by genetic engineering or any other method) one or two varieties of rice, for example, which are economically viable in all respects (in terms of production cost, availability and affordability) yet contain all the nutrients of rice? This will no doubt help combat the increased need for food to satisfy an ever-growing population. Without reducing the other diverse varieties of rice, all other varieties may be cultivated in a limited land for preservation of species, to please connoisseurs and food-lovers. This is similar to a contemporary trip to the zoo to see tigers and lions, while at one point in time (during the hunter-gatherer period, for example) we lived more intimately among nature with their ancestral tigers and lions.

Biodiversity is highly patterned and is intimately connected with cultural diversity. The greatest storehouse of biodiversity lies in regions that are warm and humid, like tropical rainforests. Interestingly, the richness of species is concentrated globally in regions of high human density. The world's twenty-five biological hotspots, identified by biologists as especially rich in endemic species, are also in the region of high population density and growth rates. Larger human concentration reflects an increasing number of indigenous people and is therefore a storehouse of language and cultural diversity. According to published reports, sixteen of the twenty five countries that were ranked highest in terms of endemic mammals, reptiles and amphibians were also similarly ranked in terms of endemic languages. The number of endemic vertebrates in Tanzania, Zaire and Cameroon in Africa, for example, are 113, 134

and 105 respectively and the respective endemic languages are 101, 158 and 201. Similarly, the number of endemic vertebrates in India and Indonesia is 373 and 673 respectively while the respective number of endemic languages is 309 and 655. An explanation of this correlation of cultural and biological diversity is that smaller indigenous communities are more likely to protect the biological resources on which their survival and sustenance depends. They try to protect biodiversity and environment through various customs and practices that are often derived from the knowledge rooted in local languages. Cultural diversity reflects a storehouse of knowledge just as biodiversity reflects a storehouse of biotic wealth and information.

The end of one of India's oldest languages as the last speaker of Andaman Bo died in February, brought fresh attention to the fact that about 330 of the approximately 6500 languages currently spoken in the world are extinct (a language with less than 100 native speakers is considered extinct) and between 52 to 75 per cent are spoken by communities of 10,000 or less and are on their way to extinction. The mother tongue of about half of the people in the world belongs to the pool of the ten most

spoken languages and language diversity is more threatened today than birds and mammals. Since language is intimately connected with culture, the erosion of language diversity signals the decline in cultural diversity as well as biological diversity. Culture holds the knowledge of biodiversity from which it is born and nurtured. The disappearance of cultural diversity bodes ill for the rich pool of knowledge, variety of skills and societal values that have evolved within species over millennia. The growth of globalization in the last couple of decades has resulted in a trend towards cultural homogeneity, and this has been exacerbated by the speed at which information is now transmitted from one place to other. One can readily imagine what a loss it will be if the whole world were to have one language, one culture and one faith.

Biodiversity is a complex issue and the epicircle of knowledge in this regard is smaller than the epicircle of ignorance. The subject requires both discussion and argument, or to state it epigrammatically, "Discussion is an exchange of knowledge, and argument is an exchange of ignorance." □

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