

Defining biodiversity resources

Madhav Gadgil

The scope of the Biological Diversity Bill, tabled in the monsoon 2000 session of the Indian Parliament is excessively wide covering all biological resources. Instead it should focus on diversity related end-uses such as drugs, industrial enzymes, cosmetics, dyestuffs, plant growth regulators, emulsifiers, oleoresins and genes used for improving crops and livestock through breeding and genetic intervention. It should seek to regulate collection and movement of such biodiversity resources and knowledge of their use out of limited local areas regardless of whether local people or outsiders serve as the collectors at the field level.

Lack of a focus

The Government of India has tabled in the monsoon 2000 session a Biological Diversity Bill in response to the new international regime of national sovereignty over biological resources ushered in by the Convention on Biological Diversity (CBD), in force since December 1993 (refs 1, 2). Its objectives, in common with CBD, are to promote conserva-

tion, sustainable use and equitable sharing of benefits arising from commercial utilization of biological diversity resources and knowledge of their uses. The Act has several positive features, for instance, the recognition of the significance of institutions of local governance, such as Panchayats, in managing biodiversity and organizing benefit sharing³. The Act has been arrived at through a very welcome, open, participatory process that has

been promoted by three successive Union Ministers. Yet, it has certain deficiencies that must be addressed.

One such significant deficiency is that the Bill altogether lacks a focus. It sets out to regulate the use of all biological resources through the length and breadth of the country. This would be a stupendous task anywhere in the world; it is quite impossible in a biomass-based civilization such as ours. The bill defines

Box 1.

Clause 2: In this Act, unless the context otherwise requires –

- (b) 'Biological diversity' means the variability among living organisms from all sources and the ecological complexes of which they are part and includes diversity within species or between species and of eco-systems;
- (c) 'Biological resources' means plants, animals and micro-organisms or parts thereof, their genetic material and by-products with actual or potential use or value, but does not include human genetic material;
- (d) 'bio-survey and bio-utilization' mean survey or collection of species, sub-species, genes, components and extracts of biological resources for any purpose and include characterization, inventorization and bioassay;

Clause 3: (1) No person referred to in sub-section (2) shall without previous approval of the National Biodiversity Authority obtain any biological resource occurring in India or knowledge associated thereto for research or for commercial utilization or for bio-survey and bio-utilization.

(2) The persons who shall be required to take the approval of the National Biodiversity Authority under sub-section (1) are the following, namely:

- (a) A person who is not a citizen of India;
- (b) A citizen of India, who is a non-resident as defined in Clause (30) of section 2 of the Income-tax Act, 1961;
- (c) A body corporate, association or organization – (i) not incorporated or registered in India; or (ii) incorporated or registered in India under any law for the time being in force which has any non-Indian participation in its share capital or management.

Clause 7: No person who is citizen of India or a body corporate, association or organization which is registered in India shall obtain any biological resource for commercial utilization or bio-survey and bio-utilization except after giving prior intimation to the State Biodiversity Board concerned: Provided that the provisions of this section shall not apply to the local people and communities of the area, including *vaids* and *hakims*, who have been practising indigenous medicine.

Clause 40: Notwithstanding anything contained in this Act, the Central Government may in consultation with the National Biodiversity Authority, by notification in the Official Gazette, declare that the provisions of this Act shall not apply to any items, including biological resources normally traded as commodities.

biological resources as plants, animals and micro-organisms, or parts thereof, their genetic material and by-products with actual or potential use or value (Box 1, Clause 2). It requires all foreign citizens or corporate bodies to seek permission of the National Biodiversity Authority for any use or survey of India's biological resources (Box 1, Clause 3). It further stipulates that no Indian citizen or corporate body registered in India shall obtain any biological resource for commercial utilization or survey except after giving prior intimation to the State Biodiversity

Board. It goes on to clarify that the provisions of this section shall not apply to local people and communities, including practitioners of indigenous medicine (Box 1, Clause 7).

However, the Act offers no definition of local people and local communities, leaving it to the bureaucracy and the rules to be formulated. So poor people displaced by a dam and resettled may be considered non-local and their collection of beedi leaves treated as being in violation of the Act. On the other hand, any Indian or foreign commercial firm only

has to employ local people to collect any biological produce they want and be free to carry on their activities without intimating the Government authorities. It also leaves it to the discretion of the Government authorities to exempt other normally traded commodities (Box 1, Clause 40). These arrangements are evidently quite inadequate.

Defining end uses

What the Bill should instead do is to focus on the end-uses of biological

Table 1. End uses related to specific, variable properties of biological resources

Product	Use	Biological origin
Drugs	Medicine	Micro-organisms, e.g. Antibiotics; Plants, e.g. steroids; Animals, e.g. heparin; Enzymes from micro-organisms, plants and animals.
Enzymes	Industrial	Micro-organisms, e.g. proteinase; Plants, e.g. papain; Animals, e.g. rennin
Flavours	Food	Plants, e.g. vanilla
Colouring agents	Food and cosmetics	Plants, e.g. red colour of Byadgi chillies
Fragrances	Perfumes	Plants, e.g. jasmine; Animals, e.g. musk
Cosmetics	Cosmetics	Plants, e.g. lanolin; Animals, e.g. triglyceride esters
Emulsifiers	Cosmetics, soaps, food	Plants, e.g. laurate
Dyestuffs	Tannins	Plants, e.g. myrobolam
	Textile dyes	Plants, e.g. indigo
Plant growth regulators	Agriculture	Plants, e.g. auxins
Biological agents	Agriculture	Plants, e.g. azadirachtin
		Micro-organisms e.g. <i>Bacillus thuringiensis</i>
Processes		
Bioremediation	Removal of metal ions from waste water	Micro-organisms
Biobeneficiation	Removal of calcium from alumina	Micro-organisms
Biotransformation	Hydrocarbon degradation	Micro-organisms
	Steroid transformation	
	Leaching of metals	
Oleoresins and oleo chemicals	Flavours	Plants; Animals; Micro-organisms
	Adhesives	
	Lubricants	
	Plastics	
	Cosmetics	
Gene products from cloned genes	For industrial and medical products	Micro-organisms, e.g. pectinase; Plants, e.g. endo-1,3- β -glucosidase; Animals, e.g. insulin
Improving crops and animals through breeding and genetic interaction	Salt tolerance in rice	Plants
	New colours in ornamental plants	
	Increasing growth hormone production for larger size in fish (Salmon, Tilapia)	Animals
	Increasing milk production in dairy animals	
	Production of desired proteins (e.g. tissue plasminogen activating factor) in milk of dairy animals	

resources that depend not on the bulk properties that are common, but on special properties that vary greatly⁴. Examples of such diversity-related end uses include those as drugs, industrial enzymes, food flavours, fragrances and cosmetics, emulsifiers, dyestuffs, plant growth regulators and pesticides, oleoresins, and genes used for improving crops and livestock through breeding and genetic intervention (see Table 1). The Bill should specify some such set of end uses and then aim at regulating the collection of biological resources for manufacture of known products or for survey and research activities oriented towards development of new products. It should step in when the material is moved outside the locality, whose limits may be defined as those of a Gram Panchayat or a Development Block, regardless of whether local people or outsiders undertake the physical collec-

tion. The Bill should similarly deal with local oral as well as codified knowledge of uses pertinent to such end uses. This would help identify a focused, manageable task for the National Biodiversity Authority and the State Biodiversity Boards without getting them mired in having to define their task with boundless possibilities of corruption. This long-awaited Bill represents a significant opportunity. It is important that we make most of it by clearly defining its focus.

-
1. Lok Sabha Secretariat 2000, The Biological Diversity Bill, 2000, Bill No. 93 of 2000.
 2. United National Environmental Programme, Convention on Biological Diversity, 1992.
 3. Utkarsh, G., Rao, P. R. S. and Gadgil, M., *Curr. Sci.*, 1999, **77**, 1418–1425.
 4. Gadgil, M. and Rao, P. R. S., *Nurturing*

Biodiversity: An Indian Agenda, Centre for Environmental Education, Ahmedabad, 1998.

ACKNOWLEDGEMENTS. This article owes a great deal to a discussion held at Indian Institute of Science on 4 July 2000 to review the provisions of the Biological Diversity Bill, 2000. I am grateful to the many environmentalists, administrators, legal experts, scientists and industrialists who participated in this discussion for their valuable inputs. In particular, I wish to thank Shri P. R. Seshagiri Rao for his help.

Received 18 July 2000; accepted 20 July 2000

Madhav Gadgil is in the Centre for Ecological Sciences, Indian Institute of Science, Bangalore 560 012, India. (e-mail: madhav@ces.iisc.ernet.in).