

“Implementation of Biological Diversity Act - With Specific Reference to Traditional Knowledge”

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ABSTRACT

The Biological Diversity Act was legislated in 2002 for the national implementation of the Convention Biological Diversity which was ratified by India in 1994. This law, in line with the CBD, has the triple objectives of conservation, sustainable use and equitable benefit sharing although in its operative parts it deals mainly with issues related to access and benefit sharing. Although India has been a victim of biopiracy for long it took India almost a decade after ratifying CBD to create this law to check biopiracy. Although the Act fails to make a categorical assertion of nation sovereignty over biodiversity, it prohibits access to biodiversity for non-nationals and other foreign entities without the prior permission of the National Biodiversity Authority (NBA) (Section 3) established by this Act. The Act also requires any access to biodiversity and related knowledge to be subject mutually agreed terms based on equitable sharing of benefits arising out of the commercial use of the accessed biodiversity (Section 21). It also requires that research results pertaining to biodiversity shall not be transferred abroad without the prior approval of NBA, publication in scientific journals and presentations in seminars are exempted (Section 4). The Act also stipulates that patent right on inventions based on biodiversity obtained from India can be claimed only after obtaining the prior approval of NBA (Section 6.1). Indian citizens and entities can access biodiversity for commercial use or undertake bio-survey for commercial utilisation only after giving prior intimation to concerned State Biodiversity Board (SBB), vairs and hakims are exempted (Section 7)

Keywords: *Biological Diversity, Biopiracy, Commercial, Bio-Survey*

INTRODUCTION

NBA is also mandated to oppose the grant of intellectual property rights abroad on biodiversity or related knowledge obtained from India (Section 18.4). The Act empowers the local communities by providing for the establishment of Biodiversity Management Committees (BMCs) in every panchayat for the promotion of the conservation, sustainable use and documentation of the local biodiversity and chronicling the related knowledge (Section 41). However, this empowerment is only partial as there is no requirement of the consent of BMC for NBA to take decisions relating to the use of biodiversity and related knowledge occurring within the jurisdiction of the BMC, but only need to be ‘consulted’ (Section 41.2).

Biodiversity Heritage Sites (BHS)

The law assumes a position counter to the letter and spirits of CBD and the ecosystem approach by providing a legal premise to displace local people in the name of conservation (Section 37.3). As discussed in the previous chapter, displacement in the name of conservation has affected a large section of the Adivasis and other local communities and the rehabilitation measures, even when they were legally required, were absent or inadequate. Such displacements also alienate the traditional society which was the historical caretakers of the biodiversity that is sought to be protected.

The Act also makes a notable omission of the term 'indigenous' communities, to denote the Adivasi communities, while this is a term much repeated in the CBD. The CBD unequivocally recognises the indigenous communities, their knowledge systems, and their rights in relation to biodiversity management system but the Act carefully avoids the terms indigenous and uses the phrase 'local people'. This has, however been compensated for by the Forest Right Act 2006.

Besides, although the preamble of the Act states its objectives as to provide for conservation of biodiversity, sustainable use and benefit sharing, the law does not address the issues of sustainable use of biodiversity but only the limited issues of access and benefit sharing in relation to biodiversity's commercial utilisation. However, that is also due to the fact that most other issues of biodiversity management are covered by the Wildlife (Protection) Act and the Indian Forest Act. Even after a decade of enacting BDA most States still have to gather momentum in establishing Biodiversity Management Committees at the panchayat level. As discussed in previous chapter NBA has not been able to successfully handle cases of biopiracy in the country or abroad, only one case having being filed in the court so far. The only case of conviction under BDA, mentioned in the previous chapter, was registered by West Bengal Forest Department, and not by NBA. NBA needs to be adequately capacity built and properly oriented in order to undertake the effective implementation of BDA. The same is true of SBBs, in many States the SBBs function as a part of the forest departments, with forest department functionaries acting as chairperson and member secretary of the SBB.

The staff and funding are also very limited. There is a body, small though it is, of criticism that BDA is stifling research (eg Prathapan etal) which is unfounded. BDA does not restrict access to biodiversity for researchers; the restrictions and the requirement of prior permission stems from the Wildlife (Protection) Act. BDA does not restrict collaborative research work with foreign institutions either but only requires certain minimum conditions to be met in terms of the commercial utilisation of the research results. Besides, government level collaboration projects in research are exempted from the requirement of prior permission of the NBA (Section 5). The inherent constraints in BDA are summarised as follows:

- Fails to make a categorical assertion of national sovereign rights over biodiversity
- Limited largely to access and benefit sharing issues, the triple objectives mentioned in the preamble do not find adequately reflected in the operative parts
- Endorsing displacements of people for establishing Biodiversity Heritage Sites
- Leaves the legal lacuna that can be used by Indian nationals to export biodiversity without the permission of NBA

The floral and faunal biodiversity inside and above soil do have enormous value in ecosystem. The phyllosphere of plants growing at the polluted site harbours a higher population of fungi and actinomycetes. There are a large number of unknown species in Indian biodiversity. Most of these components of biological diversity have enormous social values. Human beings directly consume some of these species such as food, fisheries, fruits etc. The existence of human beings indirectly depends upon the various biological species in many respects such as medicines, woods, tea, coffee etc. The rich biodiversity of India is under severe threat owing to habitat degradation, fragmentation, over exploitation of resources, global warming etc.

The whole world is, at present, under terrific threat of extinction of various floral and faunal species. India, like other countries, is facing a major decline in biological diversity due to global warming, climate change, uncalculated and unplanned deforestation, random poaching and killing of various important rare species, unfettered industrialization etc.

Conservation of biological diversity and its sustainable development is essential for the maintenance of ecosystem and protection of environment of this earth. It is meaningless to initiate any administrative measures without legal recognition to cope with this gigantic problem. Legal measures are to be developed to prevent the loss of biological diversity and for protection of environment. Most of the countries have made legislation in this regard. The judiciary has also evolved a new approach to protect the environment. For instance, in March, 2000, the Government of Mexico cancels plans to build the world's largest salt plant on the

shores of Baja's San Ignacio Lagoon, the last pristine breeding of the gray whale and a United Nations designated World Heritage Site. In June, 2000, Supreme Court of Sri Lanka passed a landmark decision halting development of the proposed Eppawala phosphate mine. The project would have destroyed a fragile jungle ecosystem that supports rare medicinal plants and wild elephants and forced the relocation of residents in Sri Lanka's North Central Province. In India the policy and object of wildlife laws have a long history and are the result of the compelling need to restore the serious ecological imbalances caused on nature by

man. Probably the first codified laws can be traced to the third century B.C. when king Ashoka made a law in the matter of preservation of wildlife and environment.

After this, a long gap has been observed in respect of codified laws or decrees pertaining to protecting wildlife. The first codified law in India for protection of wildlife was enacted by the British and was titled as the Wild Birds Protection Act, 1887 which enabled the Government to frame rules prohibiting the possession or sale of any kind of specified wild bird which had been killed or taken during the breeding season. This Act did not prohibit nor control the large scale and unwarranted killing of a large variety of wild animals and birds throughout British India. As such, in 1912, the Government enacted the Wild Birds and Animals Protection Act, 1912. The legal position in United States of America regarding proprietary rights over wild animals appears to be quite different. The U.S. Supreme Court has expressed the view that – “-----We take it to be the correct doctrine in this country that the ownership of wild animals, so far as they are capable of ownership, is in the state, as the representative and for the benefit of all its people in common.” It is also found that the wild animals at large within its borders are owned by the state in its sovereign as distinguished from its proprietary capacity and neither such animals nor any part thereof are subject to private ownership except in so far as the state may choose to make them so.

In Indian constitution certain provisions have been inserted for protection and improvement of environment. It has been laid down that – “The state shall endeavour to protect and improve the environment and to safeguard the forests and wildlife of the country.” It shall be the duty of every citizen of India “to protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures.

Stockholm Conference

The whole world was pondering over the introduction of uniform environmental policy subject to the ratification of each State in concordance with their own constitution or their existing law. According to the International Institute for Sustainable Development (IISD), after 1962 when the the harmful effects of agricultural pesticides were pointed out, the world started to find the link between environment and development⁷. After that environment and development have gradually become part of the international agenda for development. In 1963, the International Biological Programme's ten-year study analyzed environmental damage. Later on, at the initiative of the Government of Sweden, United Nations General Assembly convened a conference on human environment (also known as Stockholm Conference) from June 5-16, 1972. It was the UN's first major conference on international environmental issues. The representatives of 113 countries, 19 inter- Governmental agencies and more than 400 inter-Governmental and non- Governmental organizations attended the conference. It is widely recognized as the beginning of modern political and public awareness of global environmental problems. The meeting agreed upon a Declaration containing 26 principles concerning the environment and development; an Action Plan with 109 recommendations and a resolution. The said Declaration basically gave impression upon the conservation of wildlife, to improve the environment, to adopt the appropriate means to effectively control, prevent, reduce and eliminate adverse

environmental effects resulting from activities conducted in all spheres, in such a way that due account would be taken of the interests of all States. This conference had a real impact on environmental policies of European Community (later would become European Union). For instance, in 1973, the European Union created the Environmental and Consumer Protection Directorate/ and composed the first Environmental Action Program. It

ultimately paved the way for further understanding of global warming leading to such agreements as the Kyoto Protocol. In that Conference the nations were held responsible for harmful environmental actions within their sovereign borders as well as actions that crossed over and harmed another State. Environmental Programme (UNEP) and many national environmental protection agencies.

Following the Stockholm Conference, many international conferences took place which reflected the growing awareness and increased focus on specific environmental issues and some important UN conventions, such as the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES 1973), the Convention on Long –Range Transboundary Air Pollution (1979), the UN Convention on the Law of the Sea (1982), the Montreal Protocol on Substances that Deplete the Ozone Layer (1987) and the ILO indigenous and Tribal people Convention(1989), are signed. In 1988, the World Meteorological Organization (WMO) and UNEP established the scientific advisory body ‘Inter-governmental panel on Climate Change (IPCC)’ to look into climate changes and its various causes.

In 1976, certain principles on environmental protection were introduced in the Constitution of India in an explicit manner through Articles 48A and 51A (g). Article 48A, part of the Directive Principles of State Policy, obligates the State to protect and improve the environment and Article 51A (g) obligates citizens to undertake the same responsibilities. This Constitutional Amendment has moved the subjects of “forests” and “protection of wild animals and birds” from the State List to the Concurrent List.

In exercise of the power under Article 253 of the Constitution of India, Government of India enacted Air Act and the Environment Act – a result of implementing India’s international obligations, as well as any decision made at an international conference, association or other body. With changing time and circumstances, India has also adopted number of national policies governing environmental management such as National Policy on Pollution Abatement (NPPA, 1992) and the National Conservation Strategy and Policy Statement on Environment and Development (NCS/PSED, 1992). India has also enacted a number of legislations such as the Wildlife (Protection) Act, 1972, Water (Prevention and Control of Pollution) Act, 1974, Environment (Protection) Act, 1986 etc.

Convention on Biological Diversity

The **Convention on Biological Diversity (CBD)**, known informally as the Biodiversity Convention, was opened for signature at the Earth Summit in Rio de Janeiro on 5th June, 1992 and entered into force on 29th December, 1993. The Convention has three main goals:

1. Conservation of biological diversity (or biodiversity);
2. Sustainable use of its components; and
3. Fair and equitable sharing of benefits arising from genetic resources

The convention recognizes for the first time that the conservation of biological diversity is “a common concern of humankind” and is an integral part of the development process. The agreement covers all ecosystems, species, and genetic resources. It sets principles for the fair and equitable sharing of the benefits arising from the use of genetic resource. It covers the rapidly expanding field of biotechnology through its Cartagena Protocol on Biosafety. The Convention is legally binding upon the countries which are parties to it.

The natural resources are limited and sustainable use of them only maintains ecobalance. The Convention recognizes that ecosystems, species and genes must be used for the benefit of human beings in such a manner which does not lead to the decline of biological diversity. It is acknowledged that substantial investments are required to conserve biological diversity.

The basic issues dealt with under this convention are:

- a) Measures and incentives for the conservation and sustainable use of biological diversity,
- b) The access to genetic resources and traditional knowledge,
- c) Sharing, in a fair and equitable way, the results of research and development

- and the benefits arising from the commercial and other utilization of genetic resources with the Contracting Party providing such resources (Governments and/or local communities that provided the traditional knowledge or biodiversity resources utilized),
- d) Access to and transfer of technology including biotechnology, to the Governments and/or local communities that provided traditional knowledge and/or biodiversity resources,
 - e) Assessment of impact,
 - f) Education and public awareness,
 - g) National reporting on efforts to implement treaty commitments.

The objectives of this Convention, to be pursued in accordance with its relevant provisions, are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.

New scientific methods may be used to protect the flora and fauna

Certain administrative policy and measures may be taken by which certain scientific methods may be adopted to protect the flora and fauna. These are as follows:

- (i) Usage of satellites to detect forest fires so that they can easily be extinguished;
- (ii) Radio tracking of animals and usage of techniques like remote camera sampling to estimate the animal population;
- (iii) Installation of wireless stations and using wireless sets for easy communication among individuals involved in field trips and antipoaching activities; and
- (iv) It is highly important to keep up the morale of forest wardens and other staff members involved in anti-poaching activities and field trips. It is also necessary to keep them up-to-date on the technology and wildlife related laws.

Legislative Measures

(1) Protocol on Bio-safety

The bio-safety rules in India are statutory in nature as they originate from the Environment (Protection) Act, 1986. These rules apply to manufacture, use/import/export and storage of micro-organisms and gene-technology products and include products made of micro-organisms that are genetically engineered. The rules cover research and large-scale applications of Genetically Modified Organisms (GMOs) and products. They also deal with hazardous organisms that are not genetically modified.

Nevertheless, it is clear that India's bio-safety regulations have undergone major adjustments in their process of evolution. These adjustments have swung from accommodation of industry and civil society concern. An interesting trend has been found that while statutory rules have not undergone amendments, the guidelines have undergone changes in a manner that is seemingly contrary to the rules. Interestingly these changes have been brought about to accommodate the demands of both industry and civil society groups that have no formal role to play in the decision-making process associated with bio-safety management. For the purpose of organizational consolidation and capacity building for bio-safety state management agencies; improvement of the system of mechanisms, policies and legal documents on bio-safety, it may be stated that-

- (i) It is required to take certain steps to consolidate and strengthen the capacity of the system of State management agencies in charge of biodiversity and bio-safety, to meet the management requirements of these two domains;
- (ii) It is also required to take certain steps for review, amend, and complete the system of mechanisms, policies and legal documents to ensure effective and efficient management of biodiversity and bio-safety domains;

- (iii) Specific impression has to be given to integrate biodiversity and bio-safety into socio-economic development strategies, master plans, programs and projects towards sustainable development;
- (iv) There is need for intensification of publicity, education and public awareness raising to boost information sharing and active participation of people in biodiversity protection and bio-safety management; It is also required to enhance international co-operation in biodiversity and bio-safety. It may be suggested that a specific scheme is to be adopted to consolidate the system of State management agencies in charge of biodiversity and bio-safety. A separate scheme is also to be adopted to raise the capacity of bio-safety management of genetically modified organisms and products and commodities originated from genetically modified organisms. The necessary action has to be taken as per the Cartagena Protocol on Bio-safety, the first international regulatory framework for safe transfer, handling and use of Living Modified Organisms (LMOs) which was negotiated under the aegis of the Convention on Biological Diversity. The specific provision requires to be inserted in Biological Diversity Act, 2002 in this regard.

(2) Introduction of definition of the term 'Traditional Knowledge' in section 2 of the Act i.e. the Definition Clause

The World Intellectual Property Organization (WIPO) defines the term 'Traditional Knowledge' stating inter alia that the content or substance of knowledge that is the result of intellectual activity and insight in a traditional context, and includes the know-how, skills, innovations, practices and learning that form part of traditional knowledge systems, and knowledge that is embodied in the traditional lifestyle of a community or people, or is contained in codified knowledge systems passed between generations. It is not limited to any specific technical field and may include agricultural, environmental and medicinal knowledge and knowledge associated with genetic resources. Although 'Traditional Knowledge' has not been defined by the CBD, Article 8(j) does define the context in which such knowledge is relevant to the CBD and therefore does provide some definition to the term. Traditional knowledge in this sense is therefore applicable to agriculture, fisheries, health, horticulture, forestry and environmental management in general. In order to extend protection to traditional knowledge, innovations and practices, various suggestions such as (a) documentation of Traditional Knowledge; (b) Registration and innovation patent system; and (c) Development of a sui generis system, have been advanced.

(a) Documentation of traditional knowledge: If the material/knowledge is documented, it can be made available to patent examiners so that such materials/knowledge are/is readily available to them. It would also facilitate tracing of indigenous communities with whom benefits of commercialization of such materials/knowledge has to be shared. It may facilitate bio-piracy. In our country, preparation of village-wise Community Biodiversity Registers (CBRs) for documenting all knowledge, innovations and practices has been undertaken in a few States. In the recent past, there have been several cases of bio-piracy of Traditional Knowledge from India. In order to prevent such instances in future, there is a need for developing digital databases of prior art related to herbs already in the public domain. Such digital database would enable Patent Offices all over the world to search and examine any prevalent use/prior art and thereby prevent grant of such patents and bio-piracy. But mere documentation may not enable sharing of benefits arising out of the use of such knowledge, unless it is backed by some kind of mechanism for protecting the knowledge. This necessitates the need for extending some kind of protection to Traditional Knowledge.

(b) Registration and innovation patent system: It involves adopting a system for registration of innovations by inventors. This will be tantamount to giving right to the inventor to challenge any use of the innovation without prior permission.

(c) Development of a sui generis system: Some have suggested that a sui generis (i.e., unique or of its own kind) system separate from the existing Intellectual Property Rights (IPR) system should be designed to protect knowledge, innovations and practices associated with biological resources. However, the parameters, elements and modalities of a sui generis system are still being worked out. There is also the need for value addition to this knowledge for converting it into economically profitable investments or enterprises. India should introduce the definition of the term 'Traditional Knowledge' in section 2 of the Act i.e. the definition clause in the line of the definition adopted by World Intellectual Property Organization (WIPO).

(3) Introduction of definition of the terms 'Bio-prospecting' and 'Indigenous biological resource' in section 2 of the Act i.e. the Definition Clause

Many countries have introduced the term 'Bio-prospecting' and 'Indigenous biological resource' in their respective legislation(s). In South Africa, 'Bio-prospecting' is defined in the Act as any research on, or development or application of indigenous biological resources for commercial or industrial exploitation. 'Indigenous biological resource' may be defined generally as-

- (i) any living or dead animal, plant or other organism of an indigenous species;
- (ii) any derivative of such animal, plant or other organism; or
- (iii) any genetic material of such animal, plant or other organism.

The term 'indigenous' must be taken to mean 'India'. India may introduce the definition of the term 'Bio-prospecting' and 'Indigenous biological resource' in section 2 of the Biological Diversity Act, 2002 i.e. the definition clause.

(4) Representation of Tribal/local Communities and NGOs

Environmental movements have long been spearheaded by civil society and Non-Governmental organizations, whether national or international. They have played an important role in raising public awareness and mobilizing people for environmental protection. The participation of Civil Society and NGOs has increased in quantitative and qualitative terms between Earth Summit and World Summit for Sustainable Development. At the national level, this Civil Society and NGOs play a crucial role for implementation of activities and legal commitment.

In our country, National Biodiversity Authority has no representatives from tribal or other communities, and from independent NGOs. The real 'conservers' and 'creators' should have been found their representative places in the corridors of National Biodiversity Authority. Section 8 of this Act should be amended accordingly so that tribal or other communities and independent NGOs may send their representatives in the constitution of National Biodiversity Authority. Section 22 of this Act should be amended accordingly so that tribal or other communities and independent NGOs may send their representatives in the constitution of State Biodiversity Board.

(5) Amendment of provision relating to Biodiversity Management Committee

Section 41 of the Biological Diversity Act, 2002 and Rule 22 of the Biological Diversity Rules, 2004, need to be amended in such a way that in the constitution of Biodiversity Management Committee (BMC), the political affiliation would be avoided completely. In this regard it may be stated that –

(i) The definition of local body is problematic, as it leaves out Gram Sabha or other village assemblies to nominate the members of BMC, the political affiliation will play an important role in the constitution and functioning of the BMC. The apprehension of political affiliation must be removed by laying down the clear structure of the committee where local people should be given the appropriate scope of representation.

(ii) The State Government must have representation in that 'local bodies' who will play the vital role in day to day functioning of the said committee and the constitution of that committee has to be approved by the State Government through concerned District Magistrate. The actual power should be vested to them. The rights of local communities, who are the most important stakeholders when it comes to conservation of biological resources, should be given the most priority.

(iii) The State Government must have representation in that Biodiversity Management Committee who will play the vital role in day to day functioning of the said committee so that BMC could not become another power center and it will actually function to conserve biodiversity or protect community rights.

(iv) The Act clearly spells out a list of functions for the BMC, such as promoting conservation and maintaining Peoples Biodiversity Register (PBR). The Rules must also clearly enumerate that list of functions in consonance with the provisions of the Act and must not render the BMC as the mere PBR maintaining authority.

(v) There should be separate provision in the said Rules for protection of the knowledge recorded in the PBR. Further there should be separate provision in the Rules for obtaining prior consent of the local communities before accessing the information in the PBRs.

(vi) The term 'consult' as laid down in rule 17 of the said Rules is to be clearly defined, otherwise in many cases consultation with the BMC might remain a mere formality.

(vi) Prior approval of 'community consent' should be required before approving or rejecting application in respect of transferring results of research and in this regard appropriate provision should be spelt out in this regard, otherwise BMC will have to act only as an advisory body in the grant of such approvals.

Gendered representation in the NBA and SBB

The Convention on Biological Diversity aims at conservation and sustainable use of biological diversity, which is defined as "the combination of life forms and their interactions with each other and the rest of the environment that has made Earth a uniquely habitable place for humans"(CBD 1992). That Convention also advocates the fair and equitable sharing of genetic resource benefits²⁰. Both sexes have to be involved in biodiversity conservation. Depending upon the role of men and women, their knowledge should be applied to different functions in livelihoods. In the Johannesburg Plan for Implementation, the contribution of women alongwith men are specified in several points. In our country women must have representation in the National Biodiversity Authority or State Biodiversity Board which may be very much useful in conservation of biological diversity. Section 8 of the Biological Diversity Act, 2002 may be amended in such a way that in consisting the National Biodiversity Authority, a certain number of members may be reserved for women of relevant field(s). Similarly section 22 of the Act may also be similarly amended in such a way that in consisting the State Biodiversity Board, a certain number of members may be reserved for women of relevant field(s). A case study from Bangladesh may illustrate the gender issue in this regard. A community-based cyclones preparedness programme in Bangladesh has observed that sites where women were not involved in village level disaster preparedness committees, responsible for maintaining cyclone shelters and transmitting warnings, made up the highest proportions of cyclone victims. In Cox's Bazar in East Bangladesh, women are now fully involved in disaster preparedness and support activities.

In this connection, it may be mentioned here that as per sub-rule (2) of Rule 22 of Biological Diversity Rules, 2004, not less than one-third of the nominated persons in the Bio-diversity Management Committee should be women.

Insertion of specific provisions in the Biological Diversity Act, 2002 to protect marine biodiversity and punishment to the persons who violate those provisions

India's marine and coastal ecosystems constitute an important natural resource, with millions of people dependent on them for their livelihoods. India has no specific legislation for Marine Protected Areas and Protected Areas are declared mainly under the provisions of the Wild Life (Protection) Act (WLPA), 1972 in both terrestrial and marine ecosystems.

However, as per decisions taken under the Protected Areas Programme of Work of the CBD, there is now more focus, in legislation, policy and practice, on community participation and co-management of natural resources. Thus, the 2002 and 2006 Amendments to the WLPA have created new categories: community reserves, conservation reserves and tiger reserves, acknowledging the principle of sustainable use. The newly enacted Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 recognizes rights (and responsibilities) of Scheduled Tribes and other traditional forest dwellers to forest land.

The livelihood of small scale fishing communities are being threatened by the poor implementation of existing fisheries legislation. Communities are of the strong opinion that control of destructive fishing practices, if effectively enforced, would have beneficial conservation impacts. In such a situation, where they perceive that their legitimate demands for better implementation of existing legislation remain unmet, the current or proposed restrictions on their relatively low-impact fishing practices, is seen as unjustifiable—catching the wrong end of the stick, as it were.

Hence,

(i) there is need for a comprehensive framework for the management of marine and fisheries resources, drawing on fisheries and integrated coastal area management approach. A review and/ or of existing legislation is required.

(ii) Provisions in existing international legal instruments relating to the rights of traditional and small-scale fishing communities with respect to conservation initiatives should be better reflected in national legislation and its policy.

(iii) Existing provisions in national legislation, such as those relating to settlement of rights, taking into account the occupational interests of fishermen in territorial waters falling within Protected Areas (PAs), and setting up advisory committees in PAs, should be urgently implemented. (iv) There should be specific provision(s) in the legislation(s) to ensure the effective participation of local communities to conserve and manage resources, traditional or otherwise, especially in view of the understanding and knowledge that communities have about their ecosystems and about their social environment.

(v) Long-term, functional and sustainable alternative livelihood options need to be developed, in consultation with the local communities. Alternative livelihood should not, by definition, mean activities alternative to fishing and fisheries.

(11) Provision for Research Institutes

Section 57 of the Act imposes liability upon the persons of the companies for the offences committed by the companies. But there is no specific provision for imposing liability for the offences committed by the Research Institutes even though there is every probability to transfer biological resources to foreign institutes as well as the foreign enterprises by the Indian Research Institute(s) or the persons involved therein. This section should be amended to impose liability upon the persons of the Research Institutes for the offences committed by the Research Institutes. A mechanism should be adopted to monitor the research work of the country which relates to biological diversity.

Development and integration of biodiversity databases

Hence, steps need be taken to update list of endangered species of flora and fauna on priority, based on internationally accepted criteria; update database on sacred groves and sacred ponds documenting bio-resources and associated knowledge conserved at these sites etc.

Strengthening implementation of policy, legislative and administrative measures for biodiversity conservation and management:-

National policies on environmental management include the National Forest Policy, the National Conservation Strategy and Policy Statement on Environment and development, and National Policy and Macro-level Action Strategy on Biodiversity. Some other sectoral policies (e.g. National Agriculture Policy and National Water Policy) have also contributed towards environmental management. The Biological Diversity Act, 2002, has been enacted to conserve biodiversity through regulating access to biological resources and associated traditional knowledge and to ensure equitable sharing of benefits arising out of their use.

Building of national capacities for biodiversity conservation and appropriate use of new technologies

The current efforts for environmental education and awareness should be strengthened to highlight the importance of conservation and sustainable use of biodiversity especially focusing on new and emerging issues such as bio-safety, climate change, and bio-fuels. It is, therefore, essential to preserve and strengthen traditional, religious, ritualistic, ethical and cultural methods of conservation; design and implement awareness programmes, particularly for rural women etc.

Valuation of goods and services provided by biodiversity, and use of economic instruments in decision making processes

It is necessary to assess the utility of traditional and innovative fiscal instruments for promoting conservation and sustainable utilization of biodiversity, develop systems for partial ploughing back of the revenues generated in protected areas, zoological parks, botanical gardens, for improving their management etc.

International co-operation & India has participated in major international events

India has also contributed to develop the agreed texts, ratified, and complied with the commitments in various international conventions relating to biodiversity. Therefore, it is necessary to consolidate and strengthen global co-operation, especially with UN agencies and other international bodies on issues related to biodiversity; develop projects for accessing funds for conservation and sustainable use of biodiversity from external sources etc. Hence, the National Biodiversity Authority (NBA) was established on 1st October, 2003 under the Biological Diversity Act and the SBBs and local BMCs which are in process of being established under the same Act, would also have to be actively involved in a number of actions. Since many of the activities are ongoing, these would be taken up and mainstreamed under the ambit of existing schemes and programmes by the Central and State Governments, public and private sector as well as civil society organizations. As regards the time frame for implementation of these activities, these would be taken up in the short term (within 5 years), medium term (between 5 and 10 years), or long term (beyond 10 years) basis.

The National Green Tribunal ACT, 2010

It has been felt for long time by the Government of India to provide effective access to judicial and administrative proceedings, including redress and remedy and to develop national laws regarding liability and compensation for the victims of pollution. India, being one of the participating countries in the United Nations Conference on the Human Environment held at Stockholm in June, 1972 and the United Nations Conference on Environment and Development held at Rio de Janeiro in June, 1992, aims to set up specialized environmental courts in the country namely 'National Green Tribunal' for the effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources including enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property and for matters connected therewith or incidental thereto. Accordingly, the Indian Legislature enacted the National Green Tribunal Act, 2010.

1. The legal framework

The British colonial rule took over the control of the forests for timber exploitation and revenue generation in the 1860s. Dietrich Brandis, a German forester with experience in forest exploitation in Burma, was appointed as Inspector General of Forests in India in 1864 and he set the foundation for the colonial rule's forest management in the country. The Indian Forest Act was created in 1865, the Imperial Forest Department was established and forest departments were established in the provinces. According to this law any land covered with trees could be declared as government property. This Act was subsequently replaced by a more comprehensive Indian Forest Act 1878 which created 'reserved' and 'protected' classes of forests and enabled the local governments to collect levy on timber. This was further amended in 1927 which continues to remain the principal law regulating forest management throughout the country. In the 1890s the British appointed Dr Voelcker, a German agricultural expert, to advice on agricultural issues, and upon his recommendation the colonial rule issued the Indian Forest Policy through a resolution on 19 October 1894, underlining the forest agricultural linkages.

Biodiversity management is done through a large set of laws, including Constitutional provisions.

5.1.1. The Constitutional provisions

A 1976 amendment of the Indian Constitution has moved forests and wildlife from the State List to the Concurrent List, paving way for enhanced Central control over forests. By the same amendment the Constitution requires the State to protect biodiversity and other natural endowments as a Directive Principle of State Policy. Article 48 A of the Constitution asks the State to endeavour to "safeguard the forests and wildlife of the country"; however, Directive Principles are only policy guidance to the State and are not legally enforceable. In the same vein Article

51A(g) makes it a duty of the citizen to protect and improve the natural environment including the forests, lakes, rivers and wildlife, as part of Fundamental Duties. Although both these articles are not enforceable, these have a significant bearing on the policy and law making process and in guiding the judiciary on environmental litigations.

Further, Article 21 of the Constitution, ensuring the protection of human life and personal liberty, known as the Right to Life provision has been widely interpreted by the judiciary to protect the environment and to provide remedial measures in instances of environmental damages. The right to life entails the right to the wholesomeness of the environment and hence the environment and natural assets have to be protected and sustainably and equitably used. Article 39.b stipulates that ownership and use of natural resources are to be distributed in a way that best serves the common good.

Conclusion and Recommendations

There is need to improve management and conservation of India's rich and diverse marine and coastal resources. India may enact a separate legislation like Marine Parks Act, 2007 (SA) prevailed in South Australia or insert specific provisions in the Biological Diversity Act, 2002 to protect and conserve marine biological diversity and marine habitats by declaring and providing for the management of a comprehensive, adequate and representative system of marine parks. Aquatic flora and fauna, which are important part of ecosystem, are being depleted day by day due to human activities. No specific legislation has been enacted yet. The Government should immediately take appropriate steps to enact a separate legislation or adequate provision should be made to prescribe punishment to the persons who violate those provisions.

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