In Search of Knowledge and Resources: Who Sows? Who Reaps?

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Introduction

This article explores ways and means to implement Article 15 of the Convention on Biological Diversity (CBD), within the context of the CBD's mandate under Article 8(j) in relation to local and indigenous communities. Article 15 is one of the pillars of the CBD. Titled *Access to Genetic Resources*, the obligations and responsibilities it lays down for access to resources and the equitable sharing of benefits arising from the use of these resources, revolve around the state. Given the CBD's mandate in relation to indigenous and local communities, any regime that seeks to implement Article 15 will necessarily need to take these groups into account. The basis for this is that the knowledge of these communities is intrinsically linked to the resource itself. Hence there can be no access regime based solely on a state's control over the resources or a state's benefit from use of the resources. The fact that implementation of Article 15 is closely linked to various other provisions of the CBD including Article 8(j) has also been recognized in the decision on access to genetic resources concluded at the third Meeting of the Conference of the Parties (COP) to the CBD.[1]

Article 15 is essentially concerned with the movement of genetic resources across territorial limits of states. The focus of this article, however, is not so much on the state/nationality of the person seeking access, but on the issue of **whose** knowledge is being appropriated along with the access to the genetic resource. The scope of the CBD is assessed in relation to how that appropriation may be contained.

This article considers briefly the significance of local and indigenous communities' knowledge in relation to research on genetic wealth in biological resources. It then analyzes the scope of Article 8(j) and Article 15 of the CBD, with emphasis on how the implementation of the latter should address the concerns of the former. Finally, the article examines some of the attempts in India to implement the two provisions, as well as some questions arising in relation to a recent benefit-sharing arrangement between a research institute and a tribal community.

Whose Knowledge?

Areas of high biodiversity often coincide with areas where local and indigenous people live. The juxtaposition of biological diversity and cultural diversity among local communities is not a coincidence: the latter has arisen as a human adaptation to the former and has in turn nurtured it.[2] The fact that these communities are distinct and that their role in conserving and sustainably using the environment should be recognized and strengthened was stressed at UNCED, although not in the form of legally binding provisions.[3] From the point of view of implementing Article 15 of the CBD, what is most significant is that the starting point of most research related to the genetic wealth of biological resources is the existing traditional ecological knowledge of indigenous and local communities with respect to the resources.[4] It has been estimated that by consulting indigenous peoples, bio-prospectors can increase the success ratio in trials from one in 10,000 samples to one in two.[5] In the experience of another expert, using traditional knowledge increases the efficiency of screening plants for medicinal properties by more than 400%.[6] This is another factor that has generated the need for a serious re-evaluation of the lessons indigenous and traditional medicine can provide for Western medicinal practice, and a greater appreciation of the special contributions and needs of indigenous and local communities.[7]

The contribution of indigenous knowledge to the actual development of a pharmaceutical drug is something which varies on a case by case basis. The fundamental question is: 'could the Western party have developed the conception of a drug without the contribution of indigenous knowledge'?[8] At the basic level, it is important to recognize that the contribution of the indigenous knowledge is the identification of the material used in developing the drug, including how the material should be used and prepared to treat particular illnesses, and the requisite dosages.[9]

Article 8(j)

The CBD is based on the premise that states have the sovereign right to exploit their own resources pursuant to their environmental policies.[10] However this concept of unitary control is qualified by certain requirements on how a state's resources are to be managed. As observed by one commentator, the UNCED documents as a whole seek to narrow the prerogatives of sovereign and property owners and to ensure that biological resources sustainably serve the ecological and cultural interests of others who depend on them.[11] Though these may not be substantial in recognizing the rights of indigenous and local communities, they are important starting points for standard setting, and reflect some kind of a normative consensus among the Parties to the CBD, which could be further strengthened.

Article 8 of the CBD deals with *in-situ* conservation. Clause (j) is concerned with local and indigenous communities. It states, with the caveats 'as far as possible and appropriate' and 'subject to national legislation', that the Contracting Parties shall:

- respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity;
- promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices;
- encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices.

This provision gives legal effect to the intention expressed in the Preamble with regard to these communities.[12] Implementation of Article 8(j) would seem to require each state to identify and document the knowledge, innovations and practices of indigenous and local communities, and to conduct research to determine what constitutes conservation and sustainable use of biological diversity. The obligation to preserve and maintain the knowledge, innovations and practices of these communities could be given content and effect through measures such as providing economically and socially sound incentives under Article 11, and by providing for research and training as required under Article 12.[13]

Agenda 21, which has a chapter devoted to the issue of indigenous people and their communities, may provide further guidance.[14] This states, *inter alia*, that research and education programmes should be aimed at:

- achieving a better understanding of indigenous peoples knowledge and management experience related to the environment and applying this to contemporary development challenges;
- increasing the efficiency of indigenous peoples resource management systems, for example, by promoting the adaptation and dissemination of suitable technological innovations.[15]

Principle 22 of the Rio Declaration is also relevant. It provides that indigenous people and other local communities play a vital role in environmental management and development because of their knowledge and traditional practices. It further mandates that states should recognize and duly support their identity, culture and interests and enable their effective participation in the achievement of sustainable development.

Agenda 21 further calls for active participation by requiring governments to work in full partnership with indigenous people and their communities.[16] It emphasizes programmes to incorporate indigenous people and their communities' views and knowledge, including the unique contribution of indigenous women, in resource management and other policies and programmes that affect them.[17] It also mandates that governments ought to be assisted in ensuring the coherent and co-ordinated incorporation of views of indigenous people in the design and implementation of policies and programmes.[18] Under this procedure indigenous people and their communities are to be informed, consulted and allowed to participate in national decision-making, and strategies based on local initiatives are to be fully taken into account.[19] At the level of implementing this provision one of the critical elements to be considered is the capacity of the community to negotiate or to set the agenda. This was recognized in the decision on Article 8(j) at the third COP to the CBD, where emphasis was placed on the need for Contracting Parties to initiate projects on capacity-building with indigenous and local communities to address the concerns of conservation and sustainable use of biodiversity.[20]

The issue of rights over resources is not specifically addressed in any of the UNCED documents. This is of utmost importance from the point of view of giving effect, in practice, to the role of these communities, and would need to be addressed by any implementation regime. The decision on Article 8(j) at COP 3 to the CBD underscored the importance of taking note of relevant activities within the United Nations system, in particular under the Commission on Human Rights, and of international instruments such as Convention 169 of the International Labour Organization.[21]

An interesting aspect of Article 8(j) is that it requires a State Party to promote the wider application of the knowledge, innovations and practices of indigenous and local communities **with the approval and involvement** of the holders of such knowledge, innovations and practices. The term **approval** connotes the elements of **consent, permission** and **authorization** by these communities before the wider application of their knowledge, innovations and practices. **Approval** will not make any sense unless it incorporates the value of the right of these communities to say 'no' to the wider application of their knowledge, innovations and practices; and further, the right to determine the conditions for the use of the same and thereby have an element of control and a voice in the actual application of their knowledge, innovations and practices. **Involvement** connotes an element of active participation of these communities in the planning process for the wider application of their know-

ledge, innovations and practices. It goes beyond merely being informed, and implies the need for active, responsible engagement by these peoples in decisions and processes which have an impact on them.

Also of importance to Article 8(j) is the issue of Intellectual Property Rights (IPRs) obtained over subject matter developed after using the knowledge of local and indigenous communities. Decision III/17 of COP 3 draws attention to the need to conduct case studies of the impacts of IPRs on the achievement of the CBD's objectives, including relationships between IPRs and the knowledge, practices and innovations of indigenous and local communities relevant to the conservation and sustainable use of biodiversity.[22] A number of problems and conflicts arise from the point of view of local and indigenous communities with current models of IPRs which are sought to be harmonized under the agreement on Trade Related Aspects of Intellectual Property Rights (TRIPs).[23] This does not recognize informal community innovation.[24] Further, the notion of private, monopolistic IPRs under the TRIPs is an alien concept for many local and indigenous communities, since for them most knowledge and biological resources are communally owned and are meant to be shared.[25] The notion of collective IPRs is not recognized under current IPR models, or the TRIPs agreement.[26]

Suggestions for *sui generis* models have been put forward which would take into account the ecological concerns of conserving biological diversity, as well as the concerns of equity in recognizing the role and contribution of local and indigenous communities.[27] Various international human rights instruments also recognize the rights and interests of indigenous people and their communities over their resources and intellectual contributions.[28] The proposed Brazilian Indigenous Societies Act attempts to grant a concrete legal form to the rights of communities over their knowledge, innovations and practices by extending the IPR concept.[29]

Another aspect dealt with under Article 8(j) is the sharing of benefits arising from the utilization of the knowledge, innovations and practices of local and indigenous communities. Contracting Parties are asked to 'encourage' the equitable sharing of benefits. The choice of words does not seem to imply a positive right for the holders of the knowledge, innovations and practices, to share in the benefits derived from the use of their knowledge, innovations and practices. However, such an interpretation would defeat the very purpose behind Article 8(j) which is clearly to recognize the contribution of these people. Benefit-sharing would have to be addressed in any interpretation of Article 8(j) made in good faith, and in its genuine implementation.

Numerous issues on benefit-sharing will need to be resolved at the local level, for which consultation with the affected communities is necessary. This includes problems of valuing the natural resource, and the related knowledge of the community; determining what part of that value would go to the community; who in the community would get the benefit and how should the benefit be distributed i.e., in the form of royalties or development inputs, or technical know-how, or capacity building.[30] Of importance is also the question of what would happen when two or more communities, from two or more countries have nurtured the same knowledge or practice – who would receive the benefit?

A scheme for benefit-sharing would need to address other related issues, such as IPRs i.e., will benefits accrue to the local community from a patentable product obtained using their knowledge. There are two issues to consider here: (i) whether the holders of indigenous knowledge can derive benefits as joint inventors in the development of a particular drug,[31] and (ii) how the IPR regime could provide supportive mechanisms to ensure realization of benefits by indigenous and local communities. The TRIPs agreement is silent on this matter. However, a number of suggestions have been made regarding how the requirements of disclosure in a patent application can facilitate benefit-sharing by incorporating the elements of the CBD. This could be done, for instance, through stringent disclosure requirements on the country and the community from which a patentable subject matter, and information regarding its use, was obtained, as well as proof of consent of such country/community.

Article 15

Article 15 provides for the following:

- pursuant to the sovereign rights of states over their natural resources the authority to determine access to genetic resources rests with the national governments and is subject to national legislation;
- access issues are to be determined on 'mutually agreed terms';
- the principle of 'prior informed consent' of the contracting Party providing such resources is recognized, 'unless otherwise determined by that Party';
- the Party taking the resources is obliged to carry out scientific research with the 'full participation of, and where possible in' the Contracting Parties that provide the resources;
- each Contracting Party shall take measures with the aim of sharing in a fair and equitable way the results of the research and development and the benefits arising from the commercial and other utilization of genetic resources with the Contracting Party providing such resources. Such sharing would have to be on mutually agreed terms.

Overall, Article 15 does not address specifically the rights and role of indigenous and local communities. Rather, the focus is on the state in whose territory the genetic resources occur. This is significant from the point of view of indigenous and local communities, because access to the genetic resources of natural resources impacts on the communities who are dependent on those natural resources, and who are the holders of knowledge relating to the resources.

The problem is better appreciated if one considers, as mentioned above,[32] that the starting point of most research related to the genetic wealth of biological

resources is often the existing traditional ecological knowledge of indigenous and local communities. Access to genetic resources cannot be examined in isolation; it is intrinsically related to access to the knowledge and practices regarding the resource. It therefore seems incongruous that the rights and the role of the providers of that knowledge i.e., local and indigenous communities, are not included in the provisions dealing with access to genetic resources. Can the state be considered the legitimate representative of indigenous and local communities? That view has numerous drawbacks especially since states have generally not been protective of the rights or interests of indigenous and traditional communities and have, in fact, often been among the primary forces facilitating their destruction.[33] The state's role should therefore be restricted to only those situations where there is no clearly identifiable community.

The provisions on **prior informed consent** (PIC), **mutually agreed terms** (MAT) and **benefit-sharing** – the key concepts of Article 15, therefore ought to have recognized that these communities have a stake in the utilization of the resources. This becomes even more clear when read together with Articles 8(j) and 10(c).[34] Article 15, therefore ought to have provided that national legislation in this regard should take into account the right of indigenous people and their communities to be informed and to withhold consent for access to the genetic resources and to their knowledge. It has been pointed out that the essence of indigenous peoples' right to control access to genetic resources is their ability to determine for what purpose, when and for whom access will be granted, much the same way as the CBD provides for the PIC of states.[35]

The Philippines Executive Order on Biodiversity Prospecting, which takes into account the concerns of local and indigenous communities, is an interesting example of the implementation of Article 15.[36] It creates an obligation to obtain PIC from both the government and the Indigenous Cultural Communities.[37] The Andean Pact countries recently concluded a regional understanding on a Common Access System on Access to Genetic Resources which also requires applicants seeking access to obtain the PIC of, and share benefits with, both the Competent National Authority and indigenous, Afro-American and local communities.[38]

The terms used in Article 15(5) dealing with PIC provide that PIC is necessary 'unless otherwise determined by that Party'. There is a slight ambiguity created by the use of the phrase. One interpretation is that there is a positive obligation on the party seeking access to obtain the PIC of the party providing the resources, unless such requirement is expressly waived by such party. Another interpretation is that the phrase indicates that imposing the PIC requirement is an option for the provider of the genetic resources, which means that the party seeking access is required to submit to PIC only if the providing party has taken steps to establish the necessary procedure in its legal system.[39]

This point is significant in particular because many developing countries that are rich in biodiversity may not have the capacity to establish a system of new rules to regulate the activities of bioprospectors. Even where there are collection agreements, these countries may not have the capacity to hold accountable international genetic resource collectors who violate the terms of their collection agreements, unless the collectors' home countries bring an action.[40] Moreover, as pointed out by one commentator, people providing their knowledge may share it without asking for anything in return because of their superior ethical values.[41] In this case, it will be up to the receiver (depending on his moral values) to decide whether or not to provide any share of the benefits to the source(s) of the knowledge.[42] There is therefore an equal obligation on the party, who is seeking access to the genetic resources, to establish a legal regime to ascertain at the point of import into its territory, whether the resources were obtained with the PIC of the provider of the resource. Germany, for instance, has suggested that OECD countries should negotiate a code of conduct on the illegal transfer and use of genetic resources without PIC.[43]

Unlike Article 15(5) (dealing with PIC), which is ambiguous on the role of the country seeking access, Article 15(7) clearly covers both parties providing access and seeking access. In fulfilling the obligation thereunder to ensure benefit-sharing with the provider of the resource, countries seeking access could establish controls at the time of import. Further, they can also establish legislative and administrative measures in their laws and regulations regarding intellectual property and product licensing, to the effect that PIC and mutually agreed terms with the provider of the resource shall be proved. However, no country to date has developed any code/law implementing the obligations of the country receiving genetic resources and information to share the benefits obtained with the country providing the resource. The point to be noted, particularly in the context of Article 15(5) and 15(7), is that complementary efforts are necessary both by the country providing genetic resources and the country receiving the same in order to ensure effective implementation of Article 15.

Material and Information Transfer Agreements

One way to ensure compliance with Article 15 is to facilitate bilateral agreements between the bioprospector and the community/country of origin. Material Transfer Agreements (MTAs) are contractual agreements, ranging from letter statements to detailed, negotiated contracts.[44] Pioneered by industry, they are increasingly being used by public sector laboratories, particularly in the USA, and they now also appear in international germplasm exchanges, including those from developing to industrial countries.[45] Among the valuable lessons that can be borrowed from such MTAs for implementing Article 15 of the CBD in the interests of safeguarding the contribution of local and indigenous communities are:

- clearly defining the scope of the subject matter covered by the MTA so as to cover derivatives obtained from the supplied material;[46]

- reach through-royalties, i.e., a percentage share of sales or profits from any products that might be developed through use of the transferred material;[47]
- provisions can be included in the MTA to prevent patenting of the transferred material or of certain kinds of derived products;[48]
- the receiver of the material can be mandated to give the provider a non-exclusive, royalty free license under any inventions it may patent that derive from the transferred material or improvements or derivatives thereof;[49]
- provisions to prevent access to the material by third parties.[50]

An alternative term has been suggested for agreements concluded between a traditional community or group and an outside organization interested in the commercial possibilities of local biological resources: Information Transfer Agreements (ITAs).[51] These agreements recognize that compensation is not only for the material provided but also for the intellectual contribution of the community in relation to the resource. This may be effectuated by naming community members as inventors in the patent application, or by sharing patent ownership with the community.[52]

India: A Country Perspective

India is one of the 12 megabiodiversity centres in the world. It has a wide diversity of ecological habitats like forests, grasslands, wetlands, coastal and marine ecosystems. Based on the available data, India ranks tenth in the world and fourth in Asia in plant diversity. Surveys conducted so far have inventoried over 49,000 species of plants and over 81,000 species of animals. To date, only 70% of the area has been surveyed, and the flora and fauna identified are only a part of the diversity existing in India. India is also an acknowledged centre for crop diversity. It is home to 167 cultivated plant species, and 320 species of their wild relatives. The gene bank of the National Bureau of Plant Genetic Resources has a collection of over 144,000 varieties. Studies in genetic diversity are however not very widespread.[53]

There are around 53 million tribal[54] people (approximately 6% of the total population) in India belonging to 550 communities in different ethnic groups. Each tribal community has a distinct social and cultural identity of its own.[55] These communities primarily live in the forested areas of India, which in turn constitute around 19.47% of the total geographical area of the country.[56]

Over 9,500 wild plant species used by tribals for meeting their varied requirements have been recorded so far.[57] Out of 7,500 wild plant species used by tribals for medicinal purposes, about 950 are found to be new claims and worthy of scientific scrutiny.[58] In the codified medical texts of *Ayurveda* (a traditional form of medicine practised in India), a recent study estimates around 1,700 species of plants that are fully documented in terms of their biological properties and actions, and over 10,000 herbal drug formulations that are recorded for a range of health conditions.[59]

It is estimated that the availability of medicinal plants in India is under serious threat. Over 95% of medicinal plants used by Indian industry today are collected from the wild. Over 70% of the plant collections involve destructive harvesting because of the use of parts like roots, bark, wood, stem and the whole plant (in case of herbs), and this poses a definite threat to the genetic stock and to the diversity of medicinal plants.[60]

Governance Structures: Scope for Control by Local Communities

India is a federal democratic republic comprising of 25 States and 7 union territories. The Constitution envisages a clear separation of powers and responsibilities between the Union (i.e., central or federal) and State governments. The legislative powers of the Union and the State are clearly demarcated in three lists appended as a schedule to the Constitution.[61] For the purposes of administration each State and Union territory is divided into districts, blocks and villages. Under the Constitution (73rd Amendment Act), 1993, the *Panchayati Raj* system, devolving administrative powers to the local village level, was institutionalized as a third structure of governance. Each village has an assembly of all the adult members called the *Gram Sabha*. A group of villages have a *Panchayat*, whose members are elected by the members of all the *Gram Sabhas* constituting the *Panchayat*. Greater role for the *Panchayat* in ecosystem management was envisaged by the 73rd Amendment Act by placing new matters under its jurisdiction, including land improvement, land consolidation and soil conservation, social forestry and minor forest produce. However, action to implement these provisions has provided cause for disappointment.

Certain areas, designated as Scheduled Areas and Tribal Areas, are dealt with separately under the Constitution.[62] These areas are inhabited by tribals whose socio-economic and political situation, being distinct from the rest of the country, is the reason for their special status. These provisions provide for the establishment of Tribal Advisory Councils in each State having Scheduled Areas, which ensures representation of the scheduled tribes in the State Legislative Assembly. A similar Council may be created for the Scheduled Tribes in a State which has no Scheduled Areas. The administration of the tribal areas in the State of Assam in India is carried out according to special provisions that provide for an elaborate administrative set-up of District and Regional Councils. These Councils have legislative powers in respect of certain matters, including the power to make regulations for the control of trading by non-tribals.[63]

With very little action being taken under the *Panchayati Raj* amendment, the National Front for Tribal Self-Rule lobbied for the creation of a committee to examine the issue bearing in mind the special interests of the tribals.[64] The committee's recommendations were translated into the Panchayats (Extension to Tribal Areas) Act, 1996. The Act mandates each State to enact a law for scheduled areas that empowers the *Gram Sabha* (village assembly) to safeguard the traditions and customs of the people, their cultural identity and communal resources.

They are endowed with ownership over minor forest produce. They are also empowered to prevent alienation of land in the scheduled areas. Though these provisions do seem to be too broad and vague in their scope, added to the fact that the *Gram Sabha* only has **recommendatory** powers and not any actual power for taking decisions, there exists some potential to develop these into more concrete provisions for exercising control over the access to resources and knowledge of the communities in the scheduled areas.

Laws on Access

The situation in India with regard to legislative attempts in the field of biological diversity exemplify how excruciatingly slow the process of legislating to give effect to provisions in an international legal instrument can be. This is especially because significant changes are needed in the existing legal structure, and the fact that new laws need to be introduced where vacuums exist. There exists no legal instrument in India which deals with all aspects of biological diversity under one regime. Forests, coastal and agricultural biodiversity are dealt with under separate regimes. Moreover, significantly the scope of the CBD is extremely wide, and would have impacts on issues that are not strictly environmental or biodiversity-related. Trade-related issues are involved, for instance, in the provisions regarding transfer of genetic resources. Linked to this is also the issue of intellectual property rights over products derived from biodiversity, and from the knowledge of local and indigenous communities.

In practical terms all this means is that there are a variety of interests involved. To take into account the concerns of all the stakeholders would therefore require the prioritization of interests and needs. At the level of making the policy changes itself, for instance, there are at least three different ministries involved at the central level: the Ministry of Environment and Forests (MOEF); the Ministry of Agriculture (MOA); and the Ministry of Commerce (MOC). Each Ministry is engaged in developing appropriate laws; however, there seems to be little co-ordination between them.

The law in India under which there is scope for developing regulations with respect to access to plant genetic resources is the Wildlife Protection Act, 1972, a law enacted by the Union Parliament which is applicable throughout the territory of India.[65] Chapter III A of the Act provides a licensing system to regulate the cultivation and trade of specified plants. However, the list of specified plants to date contains only one medicinal plant, thus effectively leaving many threatened species outside its purview.[66] Also, no action has been taken to implement the provision of the Act which provides that the Union Government shall issue a notice specifying the forest land and areas where picking and uprooting of specified plants is to be prohibited.[67]

A Notice on Transfer of Indigenous Genetic Material was drafted by the Ministry of Commerce, but has not been issued yet. The purpose, as indicated by the title of the notice, is to regulate the transfer of indigenous genetic material occurring within the territory of India. The Preamble states that the notice is in recognition of the important contribution of farmers and local communities in protecting and improving genetic resources, and to ensure adequate returns derived from the use of community resources, knowledge, skills, innovations and practices. However, the actual contents of the draft notice do not reflect how this may be done. It simply deals with the procedure for obtaining approval from a designated governmental authority for transferring indigenous genetic material. The notice broadly states that such permission shall not be denied if the transfer does not run counter to the public interest. The interests of indigenous and local communities in terms of obtaining their prior informed consent, or any provision on ensuring adequate sharing of benefits with them, is not dealt with in the notice.

The background to the drafting of the notice provided that there would be a format of a Material Transfer Agreement (MTA) which would be built into the notice as an addendum to it, but this has not been done yet. In the absence of a MTA format, a number of gaps remain in the notice. Another aspect which has to be dealt with is the involvement and participation of local and indigenous communities. This was also meant to be dealt with separately from the access order and is of material importance for any substantive implementation of the CBD provisions. Legislative attempts in this regard therefore have to be made simultaneously with the access order, especially because experience reveals that the starting point for most research on plants is the knowledge of indigenous and local communities.[68]

The Government of India recently released an 'Outline of the proposed National Biodiversity Legislation'. Part 6 deals with 'Access to Biological Resources for Bioprospecting, Research and Development, Commercial and other uses', the objective of which is stated as facilitating access to biological resources, ensuring sharing of benefits with the country of origin and local communities.

A National and a State Authority are appointed under the law. Each has eight members. The composition of both is conspicuous in the absence of any local or indigenous community representative, and are composed primarily of government officials. The reference to a non-governmental member is made in relation to the chairpersons of both authorities. In the case of the National Authority, the chairperson is to be a 'person of eminence in the field of biodiversity issues including intellectual property rights, and allocation of shares in benefits with investors and local communities'. The demarcation of powers and responsibilities of both authorities are not clearly defined.

Any party, whether private or public, national or foreign, seeking access to biological resources is required to apply to the National/State Authority in advance for permission to access. Based on the information in the application, the Authority may give its consent for access with the condition that the applicant/recipient of the biological resources enters into an access contract with the

Authority, spelling out the mutually agreed terms for access. Among the elements of the access contract specified are:

- except on MAT between the two parties, the applicant shall not claim any IPRs directly or indirectly on accessed biological resources and/or research information, and on products based on the research and bioprospecting;
- any research/research publication on the biological resource accessed will require the prior approval of the authority;
- the applicant should show willingness to enter into benefit-sharing contracts with the local communities in the event of utilization of the knowledge, innovations and practices of any identifiable local community; but this is qualified by the phrase:'if the National/State Authority so desires';
- the applicant should be willing to contribute to the National Biodiversity Fund in case the knowledge system cannot be attributed to an identifiable group/entity.

While this is a positive development, there is need to further elaborate on the role and rights of local and indigenous communities in the entire process for access. For instance, the aspect of PIC for access to knowledge, innovations and practices of the communities in relation to the resource being accessed, has not been dealt with at all. It is also necessary to provide representation for the communities in the Authority dealing with access.

Control over Knowledge and Resources through Community/People's Biodiversity Registers

Some NGOs in India are attempting to document the knowledge, skills and techniques of local communities related to biological resources.[69] The Community (or People's) Biodiversity Register seeks to document the knowledge of occurrence, practices of propagation, sustainable harvests and conservation, as well as economic uses of biodiversity resources that reside with India's local communities.[70] This is being developed by local communities in collaboration with high school and college students and local NGOs. All information accumulated in the Register can be used or distributed only with the knowledge and consent of the local community. The aim is to ensure that members of the community are in a position to refuse access to the Register and to set conditions under which access would be allowed. The community may charge fees for access to the Register and collection of biological resources. Decisions on how to disburse the funds are made through village community meetings.

The Register aims to establish a mechanism to monitor the fate of a variety of biodiversity resources: medicinal plants, land races of crops, wild relatives of cultivated plants, etc., and then to use the information to formulate a strategy for their conservation.[71] Benefit-sharing is sought to be achieved by a system of rewards linked to actual performance through yearly monitoring and updating of the information in the Registers.[72]

Another suggestion is to have a National Biodiversity Fund from access on the whole spectrum of biodiversity-based enterprises, whether it be seeds, pharmaceuticals or cosmetics. Proceeds from this fund can then be used to reward recording of knowledge of uses of biodiversity resources.[73]

While attempts are being made in India by different NGOs to achieve statutory recognition for the Register, there has not been any positive response from the Union Government. However, the States of Karnataka and Kerala have taken steps towards its implementation. Recently the State of Kerala has, in its five-year plan, allocated substantial financial and administrative resources for documenting the biodiversity resources of the State in biodiversity registers to be documented at the level of the *Gram Sabhas* (the village assemblies) throughout the State.[74] Guidelines and training modules are being developed by different institutions to enable the process of documentation of the Registers.[75] The plan proposes to document the plant wealth, local knowledge and its use, the social set-up, the health care situation, and the financial status of the village.[76]

The Karnataka State Planning Board has prepared a draft biodiversity policy, on the basis of which it intends promulgating a Government Order to translate the recommendations into administrative action. One of its principal features is the Community Biodiversity Register to be prepared under the supervision of the *Gram Panchayat* (unit of local level governance). The policy creates a hierarchy of institutions to document and manage the information in the Registers. The transfer of biodiversity resources and information in the Registers is sought to be conducted by the District Biodiversity Cell,[77] which would enter into an agreement with the party seeking the transfer.

The fear about biodiversity registers is that the process may have the effect of placing knowledge hitherto regarded as 'secret' by communities in the public domain, and that once this is done, it would be an open invitation for corporate and research interests to freely use the knowledge available.[78] On the positive side, these registers are expected to function as tools to establish claims of individuals and communities over knowledge and uses of biodiversity resources, and to bring to them an equitable share of benefits flowing from the use of such knowledge and such resources.[79] These Registers cannot therefore exist on their own, and need to be supplemented with access and IPR laws that mandate disclosure of the source of the resource and knowledge obtained.[80] The other fear is the inherent scepticism of local level control: will it succeed? Decentralization of power and responsibility makes a great deal of theoretical sense, however, its practical implications is something that is yet to be seen.

In the absence of any law on the issue of access and benefit-sharing, the onus is on the bioprospector/the scientist/research institute/corporation, on the one hand, and the local community, on the other, to ensure control over access to bioresources and information regarding the same. While no formal bilateral contract

exists in India, the Tropical Botanical Garden Research Institute has made pioneering efforts towards sharing the benefits derived from use of local community knowledge. This effort is discussed in the following section.

The Experience of TBGRI: A Case Study

The Tropical Botanical Garden Research Institute (TBGRI) is a centre for plant research situated in the State of Kerala. The *Kani* tribals are a traditionally nomadic community who live in the mountainous forests of the Western Ghats (a range of mountains along Western India). In December 1987, a team of scientists were part of a botanical expedition into the forests. They were accompanied by a few men of the *Kani* tribe who acted as guides. During the arduous treks across the forests the scientists noticed that the tribals constantly ate some fruit which kept them energetic and agile. When the exhausted scientists were offered these, they also felt a 'sudden flush of energy and strength'.[81] When the scientists asked about the source of the fruit the *Kani* tribals were reluctant to reveal this information on the basis that it was a sacred tribal secret, not to be revealed to outsiders.[82] It was after much persuasion that they showed the plant from which the fruit (which they call *Arogyappacha*[83]) was obtained.[84] The scientists collected some specimens of the plant to study its properties.

A scientific investigation of the plant was conducted, which included chemical screening to isolate the active principles and pharmacological screening. The findings of the research can be summarized as follows: the fruit belonged to the plant taxonomically characterized as *Trichopus zeylanicus travancoricus*, which, while it has been documented, its traditional use and special properties were unknown. In addition to the anti-fatigue properties of the fruit of the plant that the *Kanis* had identified, subsequent studies confirmed the anti-stress, anti-hepatotoxic and immunodulatory/immunorestorative properties of the plant.[85]

The last phase of the research was shifted to the TBGRI, where the drug *Jeevani* was formulated with *Trichopus zeylanicus* and three other medicinal plants[86] as ingredients. Toxicity, shelf life and clinical studies were carried out by the Institute. The Institute then transferred the manufacturing know-how to Arya Vaidya Pharmacy, a manufacturer of *ayurvedic* drugs, for a license fee which had been mutually agreed. The license is for six years. TBGRI is to receive 2% royalty on any future drug sales. The *Kani* tribals are to receive 50% of the know-how fee and 50% of the royalty obtained by TBGRI.[87] This was decided at a TBGRI Governing Council meeting.[88]

The TBGRI Arrangement: Limitations from the Perspective of the CBD

Since the entire process of survey and collection began before the adoption of the CBD, the TBGRI arrangement may not present the ideal case study for understanding the provisions of the CBD. Moreover, there was no plan or agenda to determine the evolution of the benefit- sharing arrangement. Nevertheless, there may be some lessons to learn on the practical implications of some of the principles enshrined in the CBD.

There was no up-front payment at the initial phase of collection of the plant for research. The community's knowledge was passed on to the researchers as a result of a fortuitous experience. The process of dialogue with the community is something which was sustained throughout the period of research, and their contribution was acknowledged in all the publications regarding the research. However, it is difficult to say whether this procedure could qualify as the 'prior informed consent' of the community.

The *Kanis* are not a party to the agreement that TBGRI entered into with the pharmaceutical company, Arya Vaidya pharmacy, which has been licensed to manufacture the final product, i.e., the drug *Jeevani*. The decision to share 50% of the benefits with the tribals, which is liberal by any of existing standards and patterns set by different institutes and companies, was arrived at a TBGRI Governing Council meeting. No specific criteria were adopted, other than an intuitive need for fairness and equity felt by the scientists at TBGRI. A number of factors would determine the amount of returns for the community: the amount of investment made by the prospector; the value of the product eventually developed; the actual contribution of the community to the final product; the incremental value added over and above the community knowledge. The basic question is how does the prospector perceive the importance of the lead provided by the tribal community?

Another issue is whether it would have made any difference to involve the community in the process of arriving at the amount that is to be shared. This raises the question of the community's capacity to negotiate. The entire relationship between the Institute and the tribals seems to be one of trust and faith. The entire agreement reflects a proactive approach by the scientists to ensure that the tribal knowledge is not appropriated freely. The tribals, on the other hand, welcome the funds into the community; their primary concern now is to ensure the proper utilization of the money.[89] One important lesson from their interaction with TBGRI has been that they are now more aware of the potential for wider application of their knowledge, and of the need to safeguard it.[90]

As to the question of **who** in the community should receive the benefits, TBGRI has suggested that 2% of the total amount for the community should be given to the those members of the tribe who revealed the knowledge to the scientists, and the remaining 48% should be utilized for the benefit of the community as a whole.[91] How that can be achieved is yet to be ascertained. The traditional system of governance among the *Kanis* has been eroded to a large extent. TBGRI has therefore been trying to intervene and provide assistance in the establishment of a trust to manage the community's share.

Another problem relates to the cultivation of the plant *Trichopus zeylanicus* used to make the drug. This plant

requires certain specific conditions for its growth. Tissue culture experiments are being carried out to explore possibilities for the *in-vitro* cultivation of the plant. But the scientists at TBGRI believe that the plant would grow best in its natural habitat. They have made suggestions to the community of techniques for the plant's commercial cultivation. This would also provide the tribals with an opportunity to further increase their income by selling the leaves. Further, they could deal directly with the pharmaceutical corporation, and negotiate on their own terms. However, the forest land in which the *Kanis* live is not owned by them. The State Forest Department (FD) is responsible for the management of the land. The authorization of the FD is therefore required for harvesting the leaves of *Trichopus zeylanicus*. Since only the leaves of the plant are required for the drug, the plant would not need to be uprooted. However, the FD has been hesitant to grant permission to the tribals.[92] This situation is also illustrative of the interlinkages between the issues involved, i.e., the entire issue of benefit-sharing cannot be resolved unless the rights of the community to use the forest resources is secured. This security is important from the point of view of providing to the community the legal means and incentive to manage the resources for their long-term sustainable benefit. Overall, the TBGRI model of benefit-sharing reflects an important milestone in India, and an attempt that has valuable lessons to offer other bioprospectors. The elements of this arrangement, together with the other requirements under the CBD can contribute, at a minimum, to developing a model code of conduct for scientists, research institutes and corporations seeking access to biological resources and local community knowledge.

Perhaps, however, the most significant lesson of the TBGRI experience is also the most obvious, and that is the aspect of the **capacity of the local community** to negotiate.[93] The terminology of Article 8(j), and the subsequent COP decision to implement it may all sound laudable on paper. They all emphasize the need for active participation by the local community and envisage a role for them in setting the agenda for the activities affecting them. The challenge is to translate this into action.

Conclusion

The CBD has played a significant role in highlighting the interests of local and indigenous communities. At COP 3, representatives from five indigenous peoples' groups made the first interventions, and that was symbolic of the spirit behind the CBD's provision on local and indigenous communities. But the CBD is only a framework Convention which lays down broad standards and guidelines for action at the national level. Five years since it was conceived, the need now is to find ways and means to build on that framework through action at the national level.

National implementation therefore lies at the crux of the CBD. Or perhaps it is a truism as regards any law that the law **is** what it **does**, and if it does not do anything, it remains a waste of paper. Implementing the CBD in India has been a slow process; however, a number of innovative attempts have been initiated, notable among these being the Community Biodiversity Register. How these initiatives will be further developed with the interests of local communities in mind, will determine their effectiveness.

The agenda for future action is clearly stated in Decision III/14 of COP 3. An intersessional workshop is to be held in November 1997 to advance work on implementing Article 8(j), with a view to preparing a report for the fourth COP. Governments, NGOs and representatives of local and indigenous communities have been invited to submit case studies on measures taken to implement 8(j). The interim financial mechanism has been requested to examine the support for capacity-building projects for indigenous and local communities.

Ultimately one ought to recognize the role of the law as a human institution which can perform as much and as little as the humans implementing it **will** it to do so. And that is something which only posterity can judge.

Notes

1. UNEP/CBD/COP/3/38, Decision III/ 15, *Access to Genetic Resources*, adopted at COP 3, Buenos Aires, Argentina, 4 – 15 November 1996. The decision further urges governments, regional economic organizations, the interim financial mechanism and competent international, regional and national organizations to support and implement human and institutional capacity-building programmes for governments, non-governmental organizations, and local and indigenous communities, to promote the successful development and implementation of legislative, administrative and policy measures and guidelines on access. UNEP/CBD/COP/3/38, Decision III/14, *Implementation of Article 8(j)*, also emphasizes the need to consider linkages between Article 8(j) and access to genetic resources.
2. Ashish Kothari, *et. al.*, 'Conservation in India: a New Direction?', *Economic and Political Weekly*, (Bombay, 28 October 1995), 2755-2766 at 2756. See also, Vasant Saberwal, 'Pastoral Politics: Gaddi Grazing, Degradation and Biodiversity Conservation in Himachal Pradesh, India', *Conservation Biology*, 10(3) (June 1996); D. Western, 'Conservation Without Parks: Wildlife in the Rural Landscape', in D. Western & M.C. Pearl (eds.), *Conservation for the Twenty-first Century* (New York, Oxford University Press, 1989).
3. See, Agenda 21, UN Doc.A/ CONF.151/L.3/Add.26 (12 June 1992), Chapters 11, 14, 15, 26. Agenda 21, para. 3.2 states that conservation programmes will fail to be sustainable unless the basic needs of the people who depend upon the targeted resources for their livelihood are satisfied. See also, Rio Declaration on Environment and Development, UN Doc.A/CONF.151/5, (1992) 31 ILM 874, Principle 22; CBD, adopted 5 June 1992, A/CONF.151/26, (1992) 31 ILM 818, Preamble; Non-legally binding authoritative statement of principles for a global consensus on the management, conservation and sustainable development of all types of forests, adopted 14 June 1992, UN Doc.A/CONF.151/26 (Vol.1), (1992) 31 ILM 874.
4. See, for example, N.R.Farnsworth, 'Screening plants for new medicines' in E. O. Wilson (ed.), *Biodiversity*, (Washington DC, National Academy Press, 1988) which points out that of 111 commercially useful plant-based drugs, 74% were in prior use by indigenous communities; D. M. Lewis, *Millennium: Tribal Wisdom and the Modern World*, (New York, Viking Publ., 1992), illustrates numerous instances where the folk remedy of tribal people has lead to the pharmacopoeia of modern medicine; UNDP, *Conserving Indigenous Knowledge: Integrating Two Systems of Knowledge*, an independent study by the Rural Advancement Foundation International (Nairobi, UNDP, 1994), where it is

explained that indigenous knowledge has made important contributions to agriculture, pharmaceuticals, DNA research and other industrial production; Pat Mooney, 'The Law of the Seed', *Development Dialogue* (1983) where the use of genetic resources from crop plants of indigenous farmers by seed companies is discussed; Naomi Roht-Arriaza, 'Of Seeds and Shamans: the Appropriation of the Scientific and Technical Knowledge of Indigenous and Local Communities', *Michigan Journal of International Law*, 17 (1996), 919-965, where she uses a number of examples to illustrate that although many of the drugs and cosmetics we use today originated from the stewardship and knowledge of indigenous and local communities, that knowledge remains unrecognized and unvalued unless appropriated from those communities by Western corporations and institutions.

5. UNDP, *Conserving Indigenous Knowledge: Integrating two Systems of Innovation*, *id*, at 22.
6. G. S. Nijar, *In Defence of Local Community Knowledge and Biodiversity*, (Malaysia, Third World Network, 1996), 4, citing Michael Balick, 'Ethnology and the Identification of Therapeutic Agents from the Rainforest', in D.J.Chadwick and J.Arsh (eds.), *Bioactive Compounds from Plants* (1990).
7. Naomi Roht-Arriaza, n.4 above, at 929.
8. Michael J. Huft, 'Indigenous People and Drug Discovery Research: A Question of Intellectual Property Rights', *North Western University Law Review*, 89, 1678 at 1723.
9. *Id.*
10. Preamble and Article 3, CBD.
11. Lee P.Breckenridge, 'Protection of Biological and Cultural Diversity', *Tennessee Law Review*, (1992) 735-85 at 775.
12. The Preamble, para 12, recognizes the following elements: the close and traditional dependence of many indigenous and local communities embodying traditional lifestyles on biological resources; and the desirability of sharing equitably benefits arising from the use of traditional knowledge, innovations and practices relevant to the conservation of biological diversity and the sustainable use of its components.
13. See, Lyle Glowka *et. al.*, *A Guide to the Convention on Biological Diversity*, (Switzerland, IUCN, 1994), at 48. As provided in Article 12(b) of the CBD, the COP as well as the Subsidiary Body on Scientific, Technical and Technological Advice have a material role in initiating research on traditional knowledge, innovations and practices.
14. Agenda 21, Chapter 26. This chapter is titled 'Recognizing and strengthening the role of indigenous peoples and their communities' and deals with various aspects of involvement of these communities in the context of conservation and sustainable development.
15. Agenda 21, para 26.5.
16. Agenda 21, para 26.3.
17. *Id.*, para 26.5.
18. *Id.*, para 26.5 (a).
19. *Id.*
20. UNEP/CBD/COP/3/38, Decision III/ 14, *Implementation of Article 8(j)*, adopted at COP 3.
21. *Id.* The provisions of the *Convention Concerning Indigenous and Tribal Peoples in Independent Countries*, ILO Convention 169, (1989) 28 ILM 1382 are particularly noteworthy because of the impact that they could have in securing for the indigenous people control over the environment they live in and play a role in determining the use of its resources. Article 6 elaborates the right of consultation and participation of the indigenous peoples while applying the provisions of the Convention with the objective of achieving their consent or agreement with the proposed measures. Article 7 deals with the right of these peoples to decide their own priorities for the process of development as it affects their lives, beliefs and institutions and spiritual well-being and the lands that they occupy or otherwise use. It also emphasizes their right to participate in decisions relating to any development which affects them directly. Part II of the Convention deals with the aspects of: recognition of the rights of ownership and possession of the peoples concerned over the lands that they traditionally occupy, and of the right of use and access to the lands they have traditionally had access to for subsistence; safeguard the rights of the peoples to the natural resources pertaining to their lands, and their rights to participate in the use, management and conservation of these resources.

Another important development in the UN system which has important lessons for Article 8(j) is the UN Draft Declaration, as agreed upon by the members working group at its eleventh session, E/CN.4/Sub.2/1993/29. The declaration details a number of interesting provisions that could provide a sound basis for the future development of law in this area ensuring greater control for indigenous peoples over processes that affect their environment.

22. UNEP/CBD/COP/3/38, Decision III/ 17, *Intellectual Property Rights*, adopted at COP 3.
23. Agreement on Trade Related Aspects of Intellectual Property Rights, Marrakesh Agreement Establishing the World Trade Organisation, Annex 1C, (1994) 33 ILM 81. (Ed: see the article by Richard Tarasofsky in *RECIEL*, 6:2 (1997) at 148).
24. See, Michael J. Huft, 'Indigenous People and Drug Discovery Research: A Question of Intellectual Property Rights', *North Western University Law Review*, 89 (1995), 1678 at 1724. The author examines the issue of whether the owner of indigenous knowledge can be considered as a joint inventor of the patentable product developed, and concludes that where the use of the isolated drug is the same as or very similar to that of the source plant, it is clear that the contribution of indigenous knowledge has been essential for development of the drug; but where the use of the isolated compound as a drug diverges considerably from the use of the source plant in indigenous medicine, the contribution of indigenous knowledge is minimal at best.
25. D. Posey and G. Dutfield, *Beyond Intellectual Property Rights*, (Ottawa, IDRC, 1996).
26. Regarding the traditional knowledge and informal innovation practices of indigenous peoples and local communities, the Committee on Trade and Environment (CTE) states that new forms of protection adapted to the particular circumstances of local and indigenous communities do not fall within the purview of TRIPs since they were not discussed during the negotiations. Committee on Trade and Environment of the World Trade Organization, *Environment and TRIPs*, WT/CTE/W/8 (1995) 23.
27. See, G. S. Nijar, n.6 above, for discussion on Community Intellectual Rights, and D. Posey & G. Dutfield, n.25 above, for a discussion on Traditional Resource Rights. Nijar proposes a model Community Intellectual Rights Act which aims at preventing the privatization and usurpation of community rights and knowledge through existing definitions of innovation. It redefines 'innovation' as the collective and cumulative knowledge of a community, and states that the community shall, in perpetuity, be the sole custodian of the innovation. It provides for creation of a registry of innovation as the method in which the community can declare its existence to the world. Posey, through the concept of Traditional Resource Rights emphasizes indigenous people's right to self-determination, including territorial and human rights. These rights cover not only knowledge and biogenetic resources, but also cultural property, folklore and landscapes.
28. See n.21 above.
29. D. Posey & G. Dutfield, *Beyond Intellectual Property*, (Ottawa, IDRC, 1996) 152. Among the provisions of the law are: the right to maintain secrecy of traditional knowledge and to refuse access to the same; the right to apply for IPR protection, which, in the case of collective knowledge, will be granted in the name of the community or society; right of prior informed consent (to be given in writing) for access to, use of, and application of traditional knowledge; right to co-ownership of research data, patents, and products derived from research; right of communities to nullify patents derived from their knowledge; provision that IPR of indigenous communities are perpetual.
30. See, Ashish Kothari, *Conserving Life*, (New Delhi, Kalpavriksh, 1995), at 10.
31. See, Michael J.Huft, n.24 above.
32. See n.4 above and accompanying text.
33. Naomi-Roht Arriaza, n.4 above, at 948.
34. Article 10(c) provides that Contracting Parties shall 'protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation and sustainable use requirements'.
35. IUCN Environmental Law Centre, *Determining Access to Genetic Resources and Ensuring Benefit sharing: Legislative and Institutional Considerations* (Draft), (IUCN, Bonn, 1996).

36. Philippines Presidential Executive Order No. 247 on Biodiversity Prospecting, adopted on 18 May, 1995.
37. *Id.*, Section 2.
38. (Ed.: See the articles by Lyle Glowka and Monica Rosell in this issue of *RECIEL*).
39. Lyle Glowka *et.al.*, n.13 above, at 81.
40. John Mugabe, *et. al.*, 'Managing Access to Genetic Resources: Towards Strategies for Benefit-Sharing', in *Biopolicy International Series No. 17* (Nairobi, ACTS, 1996) 5.
41. Anil Gupta, 'Getting Creative Individuals and their Communities their Due', paper presented at the Regional Workshop on Community-Based Conservation, Indian institute of Public Administration, New Delhi, 9-11 February 1997.
42. *Id.*
43. IUCN Environmental Law Centre, n.35 above.
44. John H. Barton & Wolfgang E. Siebeck, 'Material Transfer Agreements in Genetic Resources Exchange – The Case of the International Agricultural Research Centres', *Issues in Genetic Resources* No.1, May 1994, 11.
45. *Id.* 12.
46. *Id.*, 20.
47. *Id.*, 14.
48. *Id.*, 21-22. The commentators are of the opinion that a patent obtained in violation of such an agreement would not be, for that reason, invalid. The supplier of the material would, however, be able to obtain damages for breach of the promise not to patent, and would also be able to obtain a compulsory royalty-free license to use the material.
49. *Id.*, 22.
50. *Id.*
51. Darrell Posey & Graham Dutfield, n.25 above, at 69.
52. *Id.*
53. National Biodiversity Action Plan on Biodiversity, 1997, issued by the Ministry of Environment and Forests, Government of India.
54. The term tribe/tribal etymologically means a clan or a race. It is used here to refer to communities which have a distinct ethnic origin.
55. P. Pushpangadan, *Ethnobiology in India: A Status Report*, (Ministry of Environment and Forests, New Delhi, 1996) 10.
56. Manorama Yearbook 1997, (Malayala Manorama, Kerala) 592.
57. P. Pushpangadan, n.55 above, at 40.
58. *Id.*
59. FRLHT study on Medicinal Plants used in Ayurveda, cited in Darshan Shankar, Conserving a Community-Based Natural Resource, paper presented at the Regional Workshop on Community-Based Conversation, (New Delhi, 9-11 February, 1997).
60. FRLHT Research Study on medicinal Plants (1995), cited in Darshan Shankar, *Id.*
61. Article 246 read with Seventh Schedule, Constitution of India, 1950. The three lists are: Union list in respect of which only the Union Parliament has power to legislate; the State list, matters in which can be legislated upon by the legislature of the State; the Concurrent list has entries that can be legislated upon by both the Union and State legislatures. The Union legislature has the residuary power of legislation in respect of any matters not enumerated in any of the lists. From the point of view of ecosystem management, relevant entries of these lists are: Forests, wild animals and birds are items in the Concurrent list; fisheries, agriculture, land, rights in and over land, and land tenure are matters under State jurisdiction.
62. Articles 244 & 244 A, read with Fifth and Sixth Schedules, Constitution of India, 1950.
63. Article 244 A read with Sixth Schedule, Constitution of India, 1950.
64. Update Collective, Tribal Autonomy: One Step Forward, 25 February 1997. The Bhuria Committee constituted as a response to the Front's demand produce a report that has been hailed as a landmark by the Front. *Id.*
65. The Act was amended in 1991 to include plants within the purview of 'wildlife'.
66. Schedule VI to the Act lists six plants: *beddomes cyad, blue vanda, kuth, ladies slipper orchid, itcher plant,* and *red vanda*, out of which only *kuth has medicinal value. For more details see, Sarbani Sarkar, Medicinal plants and the Law* (WWF- India, New Delhi, 1996) 26-27.
67. Sarbani Sarkar, *Id.*
68. See n.4 above and accompanying text.
69. The Community Register is a NGO initiative and is yet to receive governmental and legal approval. Information regarding the same can be obtained from: Community Register Secretariat, c/o Foundation for Revitalisation of Local Health Traditions, 50 MSH Layout, 2nd stage, 3rd main, Anand Nagar, Bangalore 560012, India; and Kalpavriksh, C 17/A Munirka, New Delhi 110067, India.
70. Madhav Gadgil *et. al.*, 'People's Biodiversity Register', Amruth, 1(5) (October 1996) at 2. See also, 'Implementing Article 8(j) of the CBD through Peoples' Biodiversity Registers', *Bulletin of the Working Group on Traditional Resource Rights*, 4 (Winter 1997) 14-16.
71. *Id.*, at 6.
72. *Id.* at 7
73. *Id.*
74. Kerala State Planning Board, Economic Survey 1995-96. I.S. Gulati, Vice-Chairman of the Kerala State Planning Board estimates that 35 to 40 percent of the programmes under the plan devolve onto the local level authorities, in his Foreword to *Biodiversity,* (TBGRI, Kerala, 1996).
75. For example, see, P. Pushpangadan, *et.al., Biodiversity*, (TBGRI, Kerala, 1996).
76. *Id.*, 54-63.
77. A district would have a number of gram panchayats under its jurisdiction.
78. See, 'Implementing Article 8(j) of the CBD through Peoples' Biodiversity Registers', Bulletin of the Working Group on Traditional Resource Rights, 4 (Winter 1997), 14-16.
79. Madhav Gadgil, n.70 above, at 3.
80. 'Implementing Article 8(j) of the CBD through Peoples' Biodiversity Registers', *Bulletin of the Working Group on Traditional Resource Rights,* 4 (Winter 1997), 14-16.
81. P. Pushpangadan, 'Arogyappacha: The Gensing of Kani Tribes of Agastyar Hills (Kerala) for Evergreen Health and Vitality', *Ancient Science of Life, VII(1) (July 1988), 13-16 at 13.*
82. *Id.* at 14.
83. The term means 'the greener of health, that is the one that gives very good health and vitality'. It is claimed by the *Kani* tribals that one can live for days together without food, and still be able to perform rigorous physical work by eating a few fruits of arogyappacha every day. *Id.* at 13.
84. *Id.*
85. P. Pushpangadan, 'Tropical Botanical Garden Research Institute: People Oriented Sustainable Development Programme', paper presented at the UNEP/GEF Indigenous Peoples' Consultation Meeting, Geneva, 29-31 May 1996.
86. These three plants are Withania somnifera, Piper logum and *Evolovulus alsonaides*, which were identified by applying the principles of the traditional medicinal system of Ayurveda, by the experts working for the TBGRI. S.Rajasekharan, TBGRI, personal communication, April 1997.
87. P. Pushpangadan, n.85 above.
88. P. Pushpangadan, Director, TBGRI, personal communication, April 1997.
89. Mallan Kani, Member of the *Kani* tribe, personal communication, April 1997.
90. *Id.*
91. S. Rajaeskharan, TBGRI, personal communication, April 1997.
92. Information in this paragraph has been obtained in the course of personal communication with P. Pushpangadan and S. Rajasekharan, TBGRI, April 1997; and from the following papers: P. Pushpangadan, *et. al.*, 'Tropical Botanical Garden Research Institute: People Oriented Sustainable Development Programme', paper presented at the UNEP/GBF Indigenous Peoples'; and V. George, *et. al.*, 'Issues related to Ethnobotanical Drug Discovery and Intellectual Property Rights of Indigenous Communities', paper presented at the Sixth Swadeshi Science Congress, (Kottayam, Kerala, India, 5-7 November 1996).
93. See n.16-20 above.

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