Chapter -V

Traditional Knowledge Under CBD And Biopiracy
TRADITIONAL KNOWLEDGE UNDER CONVENTION ON BIOLOGICAL DIVERSITY AND BIOPIRACY

Each time someone claims a bit of India as their own - and in these times of patent wars, we are fighting claims to about 40 products all over the world the - country goes into a tailspin. Anger, Confusion, Desperation and Determination to fight it out (one more time) do urgent rounds of government offices, agricultural bodies and NGO's. Perhaps rightly so, since Basmati, Neem and Haldi have never been too far from an Indian's life and the idea that someone east may acquire the right to own trade and market it is more than a bit jolting.¹

Warning the world against “Scientific and Technological Colonialism” India offered to help all developing countries in protecting their wealth of traditional knowledge with patents so that it is not exploited by the west for making money.

Part –A. Traditional Knowledge under Convention on Biological Diversity

To-date one of the most prominent provision on traditional knowledge is Article 8 (j) of the CBD which says - "respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for conservation and sustainable use of biological diversity and promote the wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge innovations and practices."

This Article specifies traditional knowledge which is relevant for the preservation or conservation of biological diversity. This term biological

diversity refers to the variety within the living world. To protect the traditional knowledge it is worthwhile to have some quest to know about biological diversity.

1. Meaning of Biodiversity

The most striking feature of the earth is the existence of life, and the most striking feature of life is its diversity. Biodiversity refers to the variability amongst the species, population, communities and ecosystems, both wild and domestic, that constituent’s life of an area or eventually of the entire planet. It occurs at three levels viz. (i) species level (ii) genetic level (iii) ecosystem level. Biodiversity has long been a source of scientific curiosity but now it is increasingly becoming a source of concern. Before the enactment of Biological Diversity Act, 2002, India had no specific biodiversity law to safeguard biodiversity as national property against unauthorized exploitation. Now the enacted law biodiversity says:

‘Biological Diversity’ means the variability among living organisms from all sources and the ecological complexes of which they are part and include diversity with species or between species and of ecosystems.\(^2\)

‘Biological Resources’ means plants, animals and micro-organisms or part thereof, their genetic material and by products (excluding value added products) with actual or potential use or value but does not include human genetic material.\(^3\)

Diversity of species in natural habitats is high in warm areas and decreases with increasing latitude and altitude. Diversity is usually higher in rainfall zones than in drier areas. That is precisely the reason why tropical most

\(^{2}\) The Biological Diversity Act, 2002 Sec. 2(b).
\(^{3}\) Id. Sec. 2 (c).
forest contains half of the world’s species though they occupy only seven percent of the land area.\(^4\)

Biodiversity is not evenly distributed over different parts of the world. India ranks sixth among twelve mega biodiversity countries in the world. The total number of species in the world is estimated to be around 5 to 30 million out of which about 1.4 million species have been described. The total number of plant species in India is estimated to be about 45,000.

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Table No.16: RECORDED No. OF SP.: INDIA AND WORLD
(ESTIMATED NO. RANGES FROM 2-15 MILLION)

<table>
<thead>
<tr>
<th>GROUPS</th>
<th>NO. OF SP. (INDIA)</th>
<th>NO. OF SP. (WORLD)</th>
<th>% INDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mammals</td>
<td>350</td>
<td>4629</td>
<td>7.6</td>
</tr>
<tr>
<td>Birds</td>
<td>1224</td>
<td>9702</td>
<td>12.6</td>
</tr>
<tr>
<td>Reptiles</td>
<td>408</td>
<td>6550</td>
<td>6.2</td>
</tr>
<tr>
<td>Amphibians</td>
<td>197</td>
<td>4522</td>
<td>4.4</td>
</tr>
<tr>
<td>Fishes</td>
<td>2546</td>
<td>27730</td>
<td>11.7</td>
</tr>
<tr>
<td>Arthropoda</td>
<td>68389</td>
<td>987949</td>
<td>6.90</td>
</tr>
<tr>
<td>Flowering</td>
<td>15000</td>
<td>250000</td>
<td>6.6</td>
</tr>
<tr>
<td>Plants</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Paper presented at Symposium in Raipur on 8th November 2008

Indian is having two biodiversity hot-spots namely the 'Western Ghats' and the 'Eastern Himalayas', which are included amongst the top eight most important hot-spots in the world, ten bio-geographic regions, two major realms called the Palaeoarctic and the Indo-Malayan; and three biomasses namely the tropical humid forests tropical dry/deciduous forests and the warm deserts and semi-deserts. India has 850 species of bacteria, 14500 species of fungi, 6,500 species of algae, 2000 species of lichens, 2,850 species of bryophytes, 1100 species of pteridophytes. The endemism (endemic species are confined to a particular region or area) of Indian biodiversity is very high. About 33% of the country's recorded flora is North-East, Western Ghats, North-West, Himalaya and the Andaman - Nicobar Islands. As many as 167 species of crops 320 species of wild crop relatives and several species of domesticated animals have originated here. The genetic diversity within these species is astounding. For example, there are 4000 varieties of Rice, hundreds of varieties of Mango, 27 breeds of cattle and 18 breeds of paltry. The amazing biodiversity is not a freak
of nature, but a result of careful selection and even cross breeding over center by Indian’s farmers and pastoralists.\textsuperscript{5}

In crops diversity maintains soil fertility, optimizes soil management in rain feed belts acts as insurance against crop failure ensures food security, provides a variety of fodder and assures availability of seeds besides acting as a treasure chest of potentially valuable but as yet unknown resources. Thus plant genetic diversity, both at intra-species and inter-species levels is a crucially important part of farming systems and farming economy.

\begin{center}
\textbf{Number of Living Species of Higher Plants Currently Known}
\end{center}

\begin{figure}
\centering
\includegraphics[width=\textwidth]{chart.png}
\caption{Higher Plants: Total Species, 248,000}
\end{figure}

\textsuperscript{5} National Roving Seminar on Traditional Knowledge, 13 -14 August 2008 at Dehradun, (Organized by Government of India and WIPO)
**TABLE NO. 17: RECORDED PLANT SP.: INDIA AND WORLD**

<table>
<thead>
<tr>
<th>TAXA</th>
<th>INDIA</th>
<th>WORLD</th>
<th>% OF INDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacteria</td>
<td>850</td>
<td>4000</td>
<td>21.25</td>
</tr>
<tr>
<td>Viruses</td>
<td>Unknown</td>
<td>4000</td>
<td>-</td>
</tr>
<tr>
<td>Algae</td>
<td>6,500</td>
<td>40,000</td>
<td>16.25</td>
</tr>
<tr>
<td>Fungi</td>
<td>14,500</td>
<td>72,000</td>
<td>20.14</td>
</tr>
<tr>
<td>Lichens</td>
<td>2,000</td>
<td>14,000</td>
<td>11.80</td>
</tr>
<tr>
<td>Bryophytes</td>
<td>2,850</td>
<td>16,000</td>
<td>17.80</td>
</tr>
<tr>
<td>Pteridophytes</td>
<td>1,100</td>
<td>13,000</td>
<td>8.46</td>
</tr>
<tr>
<td>Gymnosperms</td>
<td>64</td>
<td>750</td>
<td>8.53</td>
</tr>
<tr>
<td>Angiosperms</td>
<td>17,500</td>
<td>250,000</td>
<td>7.00</td>
</tr>
</tbody>
</table>

*Source: Paper presented at Symposium in Raipur on 8\(^{th}\) November 2008*

(a) **Levels of Biodiversity:**\(^6\) Biodiversity can be explored at three levels:

(i) Genetic (ii) Species and (iii) Ecosystem

(i) **Genetic diversity** refers to the diversity (a) between individuals within the populations (b) among populations within the species. *Species* is a classification as well as a biological unit with populations interbreeding or sharing a common lineage of descent.

(ii) **Species biodiversity** is the variability among the different species inhabiting a community and it is at the hub of biodiversity.

(iii) **Ecosystem diversity** refers to the range of ecosystem occurring in a biogeography region.

The components of diversity can be characterized by distinguishing them and quantifying the local distribution of species, similarity among local

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assemblages and the rate of change in species composition with respect to ecological conditions.

(a) Alpha diversity (a): diversity within communities is measured as the number of species occurring within an area of a given size and the distribution of individuals among the species.

(b) Beta diversity (β): diversity between communities measures the turnover of species between different types of communities or habitats.

(c) Gamma diversity (γ): Total diversity of a region refers to an overall diversity within a large area and corresponds to the species richness at landscape level. It is the product of the alpha diversity of the communities of a landscape and the degree of beta differentiation among them.

**Hot Spots:** Hot Spots are biologically rich areas with high diversity and a large percentage of endemic species. For example, 20% of world plants are found on 5% of earth surface a leading environmental conservation organization has identified 24 places around the world calls biodiversity hot spots.

Convention on Biological Diversity (CBD)\(^7\) defines ‘biological diversity’ as: Biological diversity means the variability among living organisms from all sources including *inter-alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part, this include diversity within species between species and of ecosystems.

2. **Significance of Biodiversity**

Biodiversity is an extremely important part of life on Earth. It is only the variety of living organisms on our planet, but also the interdependence of all the living things including humans. It thus creates and maintains ecological systems. The most recognizable of which are earth’s biomes, which can be

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divided into the broad categories of forests, tundra, aquatic, grasslands and deserts life is in fact one of the major features that distinguishes biomes from one another. ‘Biomes’ are defined as the world’s major communities classified according to the predominant vegetation and characterized by adaptations of organisms to that particular environment. Without vegetation or organisms these landscapes would be virtually in-distinguishable from one another clearly, life plays a major role in the function of ecosystems and the variety or diversity, of this life has played a major role in the evolution of the world.  

Biodiversity is not only a mutual dependency of plants animals and humans but the balance of nature also depends upon it. Value of biodiversity is unmeasured but the benefits drawn by human being are-

By Direct use-

- Agriculture- New crops and varieties
- Pharmaceuticals- About 20,000 plant and animal species are used for medicines.
- Industry- Timber, beverage, spices and fruits etc.
- Eco-tourism- is affected by the diversity of the species and the range of habitats that can be visited e.g. the number of flowering plants, big and small games.
- By Indirect use-
- Ecosystem processes e.g. the loss to rangeland ecosystems in India due to removal of cheetah is not known.
- Option- Willingness of the society to retain un-profitable range of habitats/genes/species.
- Non use values:-

• Existence- The value of satisfaction attained by the society by the fact that rhino, lion, wild ass, bustard, rauwolfia commifora etc exist.

• Ethical- Moral and religious values attached to plants and animals.

At present it is the direct use value of biodiversity which is highly valued by local people in developing countries because of the subsistence nature of economy. People living in abject poverty, destitution and miseries are neither bothered about sustainability nor option, existence or other values of biodiversity. International organizational and the developed world on the other hand are concerned about the option and existence values of the biological resources since their approach has shifted from Quantization Growth to Qualitative Development.9

3. Convention on Biological Diversity

CBD is the only international treaty that specifically recognizes the role of traditional knowledge, innovations & practices in biodiversity conservation and sustainable development as well as the need to guarantee their protection whether through IPR or other means.

Convention on Biological Diversity (hereinafter CBD), concluded on 5 June 1992, it was the result of discussions at the Rio de Janeiro 1992 United Nations Conference on Environment and Development (the Earth Summit) towards a strategy for sustainable development following negotiation that had commenced in November 1990 under the United Nations Environment Programme (UNEP).10

The CBD administered by UNEP, establishes principals for the protection of the environment while ensuring on going economic development,

emphasizing conservation of biodiversity, sustainable use and fair and equitable benefits sharing of the use of genetic resources. The CBD is also a significant international instrument in the development of rights for indigenous and traditional resources and aims to provide for the equitable sharing of the benefits denied from them thereby re-invigorating, national sovereignties with respect to biological and intellectual resources. The importance of CBD is that of a tool for indigenous and local communities to the conservation of biodiversity.

"CBD discuss the traditional knowledge - "respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for conservation and sustainable use of biological diversity and promote the wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge innovations and practices.""11

CBD is an important re-assertion of the sovereign rights of the states over their biological resources. Article 8(j), seems to affirm that the holders have rights over their knowledge, innovation and practices whether or not they are capable of being protected by IPR. If they are not capable of being protected by existing IPR system, still there is an obligation for the government to safeguard these entitlements either through a new IPR law or by over legal or policy measures. These duties should also extend to use of traditional knowledge.

The CBD also recognizes the importance of traditional use of genetic resources in the sustainable preservation of biological diversity. CBD obliges each contracting party as per as possible and appropriate to protect and encourage customary use of biological resources in accordance with traditional

11. CBD Article 8(j)
cultural practices that are compatible with the conservation or sustainable use requirement.\textsuperscript{12}

The CBD established access to the biological resources of developing countries on a \textit{quid pro quo} basis with technology transfer from the industrialized countries and asserts that IPRs must not conflict with the preservation and sustainable use of biodiversity.\textsuperscript{13} Similarly exchange of information, Technical and scientific cooperation include the encouragement and development of exchange and use of indigenous and traditional knowledge and technology is the spirit of CBD.\textsuperscript{14}

The CBD was entered into some months before TRIPS and its relationship to TRIPS is some what inconsistent. TRIPS recognizes and promulgates private monopoly rights particularly with respect to patents conversely, the CBD is more concerned with the community control of genetic resources.

The CBD reasserts national sovereignty in contrast to the emphasis on international global trade that is encouraged by TRIPS. The economic globalization of intellectual property rights advocated in TRIPS is seen as a threat to the cultural and social welfare of indigenous and traditional group. Numerous critics argue that the spread of western capitalist culture has led to the simultaneous erosion of both biological and cultural diversity. The CBD has been criticized for its emphasis on state sovereignty an emphasis which

\begin{Verbatim}
12. CBD Article 10 (c)
13. Id., 16.5
14. Id., Article 17(2) and Article 18(4)
Article 17(2) such exchange of information shall include exchange of results of technical, scientific and socio-economic research as well as information on training and surveying programmes specialized knowledge, indigenous and traditional knowledge as such and in combination with the technologies referred to in Article 16 paragraph 1 it shall also where feasible include repatriation of information.
Article 18(4). The contracting parties shall, in accordance with national legislations and policies, encourage and develop methods of cooperation for the development and use of technologies, including indigenous and traditional technologies, in pursuers of the objections of this convention. For this purpose, the contracting parties shall also promote cooperation in the training of personnel and exchange of experts.
\end{Verbatim}
risks generalizing cultural interest & ultimately undermining the biodiversity that is enriched and protected through the preservation of cultural diversity and indigenous and traditional culture.

By utilizing biological resources and traditional knowledge new products can be produced which can claim protection under the TRIPS regime. The TRIPS agreement neither directly involves in the protection of traditional knowledge nor concerns the protection of biological diversity. The CBD on the other hand attempts to protect and preserve biological diversity and traditional knowledge. New inventions and products or the usage of traditional knowledge and the biological resources can be protected under the TRIPS regime but the same shall be beyond the private monopoly and forms common property under the CBD regime. TRIPS and the CBD both emphasize on the protection of biotechnology industry, this agenda is explicit in the TRIPS agreement through an obligation upon assignations to pass intellectual property legislation over life forms. The CBD too emphasizes intellectual property laws within which protection of traditional knowledge conforms, or at least, remains subject to but it does explicitly acknowledge indigenous communities.

The provisions of the CBD and in particular Article 8(j) have been criticized as idealizing traditional lifestyles and romanticizing or essential sing indigenous peoples. Article 8(j) has also been subjected to considerable criticism by indigenous peoples. It has been noted for example that the phrase embodying traditional lifestyles suggest that this provision applies only to indigenous people who are isolated fossilized is some cultural time warp living in a never changing present and excludes peoples who continuing colonial situation in which find.

Despite its criticism the CBD presents an important resource for indigenous rights in traditional knowledge beyond the laws. The CBD

articulates a system of conservation of Biological diversity as a universal cultural heritage through an explicit acknowledgement of customary and indigenous knowledge and technologies.

(a) Salient Features of the Convention on Biological Diversity

Objectives:

The conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of benefits arising out of the utilization of genetic resources including appropriate access to genetic resources, appropriate transfer of relevant technologies taking into account all rights over those resources and to technologies and appropriate funding.

Recognition of the intrinsic value of biological diversity and the need for its conservation in natural habitats, that these genetic resources will be available through generations, that nations have sovereign rights over their genetic resources, that conservation efforts need to be compensated, and that communities share the benefits that accrue from the use of these resources,

Countries have the sovereign rights to exploit their own resources while pursuing their own environmental policies. They also have the responsibility to ensure that the activities within their jurisdiction do not cause damage to the environment of other countries or of areas beyond the limits of national jurisdiction.¹⁶

Conservation and Sustainable use: Countries, in accordance with their capabilities, shall develop national programmes for the conservation and sustainable use of biological diversity, or adapt existing plans or programmes for this purpose, and integrate the conservation and sustainable use of

¹⁶ Convention on Biological Diversity Article 3.
biodiversity into relevant sectoral or cross sectoral plans, programmes and policies.\(^{17}\)

**Identification and Monitoring:** Countries shall identify important components of biodiversity and monitor them through sampling and other techniques, with particular attention to those which require urgent conservation measures identify activities likely to have significant adverse impact on conservation and sustainable use of biological diversity and monitor their effects, and maintain and organize data derived from activities undertaken following the above.\(^{18}\)

**In-situ Conservation:** Measures to promote the conservation of biological diversity outside their natural habitat, require countries to establish a system of protected areas, and develop guidelines for their management establish means to regulate, manage or control risks associated with the use and release of biotechnology which are likely to have adverse environmental effects, also taking into account risks to human health subject to national legislation, preserve and maintain knowledge and practices of indigenous and local communities. The application of such knowledge and innovations must also be promoted and the equitable sharing of benefits arising from the utilization of such knowledge, innovations of practices must In encouraged and cooperate in providing financial and other support, particularly to developing countries.\(^{19}\)

**Ex-situ Conservation:** To promote the conservation and maintenance of ecosystems and the recovery of viable population of species in their natural surroundings, countries shall establish and maintain facilities for ex-situ conservation and research, preferably in the country of origin of genetic

\(^{17}\) Id., Article 6.

\(^{18}\) Id., Article 7.

\(^{19}\) Id., Article 8.
T.K. Under CBD and Biopiracy

resource and cooperate in providing financial and other support for maintenance of *ex-situ* conservation facilities in developing countries.\(^{20}\)

**Sustainable use:** Countries shall integrate conservation and sustainable use of biological resource into national decision-making, and adopt measures to avoid or minimize adverse impacts on biodiversity. Encourage customary use of bioresources in accordance with traditional culture practices, and encourage cooperation between government authorities and private sector in developing methods for sustainable use of resources.\(^{21}\)

**Access to genetic resources:** National governments and national legislation have the authority to determine access to genetic resources, each country must endeavor to create conditions to facilitate access to genetic resources for environmentally sound uses to other countries and not impose restrictions that run counter to the objectives of the convention.\(^{22}\)

This article recognizes the sovereign rights of countries over the natural resources and gives the authority to determine access of genetic resources to the respective national government. This access is subject to national legislation, prior consent and should be encouraged for environmentally sound uses. The scientific research coming out on these genetic resources will be with the participation of the nation that has provided these resources. Benefits accruing out of these resources are to be shared with the contracting party that supplied these resources.

**Access to and transfer of technology:** This article recognizes that technology includes biotechnology and that achieve the provisions of the convention, it is important that technology be transferred on favorable terms to the countries that provide the genetic resources. However, the Convention states that in areas where the technology pertains to intellectual

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\(^{20}\) *Id.*, Article 9.

\(^{21}\) *Id.*, Article 10.

\(^{22}\) *Id.*, Article 15.
property rights and patents, the terms should be in line with intellectual property rights protection. National laws or policies should be in place so that the private sector also facilitates exchange of information and technology.\textsuperscript{23}

Handling of biotechnology and distribution of its benefits: Each contracting country has to take measures to ensure that biotechnological research based on genetic resources is with the participation of the country that has provided the genetic resources and the results and the benefits are shared. Countries also have to consider the need for and the modalities of a bio-safety protocol which include prior informed agreements relating to safe handling and use of genetically modified organisms.\textsuperscript{24}

Financial resources: This article states that based on its capability, each country will provide financial support to national activities engaged in meeting the objectives of the convention. The developed countries will need to pay the incremental costs incurred by developing countries in conserving biodiversity and provide financial assistance to developing countries in their attempts to meet the convention objectives.\textsuperscript{25}

Financial mechanism: This article states that the mechanism for providing financial resources will function under the authority of and be accountable to the Conference of Parties (CoP).\textsuperscript{26}

Dispute settlement: In the event of any dispute, the countries involved will first attempt to seek solutions through negotiations. Only when negotiations fail will they seek the mediation of third party. In the case that both the options do not work, it becomes mandatory for the countries to either submit the case to the International Court of Justice, or to an arbitration

\textsuperscript{23} Id., Article 16.  
\textsuperscript{24} Id., Article 19.  
\textsuperscript{25} Id., Article 20.  
\textsuperscript{26} Id., Article 21.
tribunal. The tribunal will consist of three members, two of which will be appointed by the disputing parties.²⁷

**Voting rights:** While contracting parties are entitled to one vote, regional economic organizations can also exercise their right to vote, with the number of votes equaling the number of their member countries.²⁸

**Relation between CBD and its protocols:** A country may become party to a CBD protocol only if it is party to the convention. Decisions under any protocol shall only be taken by those countries that are party to the protocol concerned.²⁹

**Financial interim arrangement:** The Global Environment Facility shall be the institutional structure on an interim basis, for the period between the conservation's entry into force and the first CoP or until CoP designates the institutional structure.³⁰

4. **The Biological Diversity Act, 2002**

The CBD states that a member country should be a party on mutually agreed terms for the access to genetic resources, but that access requires the prior informed consent of the country providing the resource. It also provides for an equitable sharing of any benefits arising from the commercial use of these resources a traditional knowledge about them. But countries must pass domestic legislation to bring these principles into their own laws. India's parliament passed the Biodiversity Act in December 2002 to address many of India's obligations under CBD.

The Biodiversity Act 2002 primarily addresses access to genetic resources and associated knowledge by foreign individual's institutions or

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²⁷. *Id.*, Article 27.
²⁸. *Id.*, Article 31.
²⁹. *Id.*, Article 32.
³⁰. *Id.*, Article 39.
compares, to ensure equitable sharing of benefits arising out of the use of these resources and knowledge to the country and the people.

The Primary Objectives of the Biological Diversity Act, 2002 are

- Conservation of Biological Diversity
- Sustainable use of the components of biodiversity
- Fair and equitable sharing of benefits arising out of the utilization genetic resources and bio-resources.

The BD Act-2002 covers all biological resources occurring and naturalized in India. Besides affirming that biological resources are sovereign property of the State, the Act also encompasses all indigenous and traditional knowledge associated with the biological resources as these forms are intangible component of biological resources, which is the major source of piracy by the bio-pirators. Basically the Act promotes conservation and National Biodiversity. Authority is empowered to check bio-piracy and to regulate transfer the result of any research. The Act provides, “No person shall without previous approval of the NBA transfer the results of any research relating to any biological resources occurring or obtained from India for monetary consideration or otherwise to any person who is not a citizen of India or body corporate or organization which is not registered or incorporated in India or which has any non Indian participation in its share capital or management.”

The publication of research paper, research project may involve biological resources or information or knowledge publication has not been declared transfer under Sec.4. The guidelines framed by the Central Government Shield ensure that in guise of publication of research paper, traditional knowledge should not go out of country.

31. The Biological Diversity Act, 2002 Sec. 4
Section further of the Act provides, "No person shall apply for any intellectual property right by whatever name called in or outside India for any invention based on any research or information on biological resources obtained from India without previous approval of National Biodiversity Authority." While granting approval NBA will impose terms and conditions which secure equitable sharing of benefits. The NBA has been given power to oppose the grant of intellectual property right in any country outside India on any biological resource obtained from India or knowledge associated with such biological resources derived from India.

Along with NBA there is also constitution of State Biodiversity Board (SBB) to promote and protect biodiversity. No Indian citizen or person or body corporate is allowed to obtain biological resource for commercial utilization without obtaining prior approval of SBB. Although it recognizes traditional knowledge of the local people and communities including Vaids and Hakims but they are kept out of intimation restriction. There is also a provision of post intimation strategy. SBB can also restrict and prohibit if it consider any activity detrimental or contrary to the objectives of conservation and sustainable use of biodiversity and sharing benefits.

**Salient Features of the Biological Diversity Act -2002**

- To regulate access to biological resources of the country equitable share in benefits arising out of the use of biological resources.
- To conserve and sustainable use of biological diversity.
- Setting up of National Biodiversity Authority (NBA), State Biodiversity Board (SBB) and Biodiversity Management Committee's (BMCs).
- NBA and SBB are required to consult BMCs in decisions relating to bio-resource/related knowledge within their Jurisdiction.

32. *Id., Sec. 6.*
• To respect and protect knowledge of local communities traditional knowledge related to biodiversity.

• To secure sharing of benefits with local people as conservers of biological resources and holders of knowledge and information relating to the use of biological resources.

• All foreign nationals/organizations require prior approval of NBA for obtaining biological resources and/or associated knowledge for use.

• Indian scientists/individuals require approval of NBA for transferring results of research to foreign nationals/organization.

• Conservation and development of areas of importance from the standpoint of biological diversity by declaring them as biological diversity heritage sites.

• Protection and rehabilitation of threatened species.

• Involvement of institutions of state Government in the broad scheme of the implementation of the Biological Diversity Act through constitution of committees.

• Protect India’s rich biodiversity and associated knowledge against their use by foreign individuals and organizations without sharing benefits arising out of such use and check Bio-piracy.

• Indian Industry needs prior intimation to SBB to obtain bio-resource. SBB has right to restrict if found to violate conservation and sustainable use and benefit sharing.

• Provisions for notifying heritage sites by State Government in consultation with local body.

• Creation of National, State and Local Biodiversity fund and its use for conservation of biodiversity. Sec. 43.

• Prior approval is needed from NBA for IPRs in any invention in India or outside Indian on Bio-resource.
Part -B. Biopiracy

5. Meaning of Biopiracy

Bio-piracy is the false claim to invention by corporations & scientists and is nothing short of institutionalized theft by the rich. The right of indigenous cultures to these resources and knowledge is replaced by monopoly of rights in favour of those who have exploited indigenous knowledge and biodiversity.

Bio-piracy is term for the appropriation, generally by means of patents, of legal rights over indigenous knowledge particularly indigenous biomedical knowledge without compensation to the indigenous groups who originally developed such knowledge. A classic case is that of Rosy Periwinkle (Madagascar Periwinkle). Research into the plant was prompted by the plants traditional medicinal role and resulted in the discovery of a large number of biologically active chemicals, including vincristine, a lucrative agent useful during leukemia chemotherapy. A method for purifying incrusting was initially patented and marketed by Eli Lilly. It is widely reported that the country of origin did not receive any payment.\(^{33}\)

Bio-piracy means “taking biological resource from one country or region to another and using it in the latter’s industry agriculture and other commercial process.”\(^{34}\) In the early decades of the present century taking away bio-resources from one country to another was not considered illegal and therefore the concept of bio-piracy was non existent. With the growth of knowledge in the field of biological conservation, especially in terms of in situ and ex-situ conservation, bio-piracy received international recognition. Countries have now started recognizing their intellectual rights over the biological material within their boundaries.

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Bio-piracy refers to the use of intellectual property system to legitimize the exclusive ownership and control over biological resources and biological products and processes that have been used over centuries in non industrialized culture. When individuals or corporations receive freely traditional knowledge from indigenous people and convert it in to private property through intellectual property rights, then this exchange of knowledge amounts to bio-piracy.

The word ‘Bio-piracy’ is a compound word consisting of ‘Bio’ which is short for ‘biological’ and ‘piracy’. According to Concise Oxford Dictionary\textsuperscript{35} ‘piracy’ means the following:

1. The practice or an act of robbery of ships at sea.
2. A similar practice or act in other forms, esp. Hijacking
3. The infringement of copyright.

Apart from the use of piracy for rhetorical effect the word does not seem to be applicable to the kinds of act referred to as bio-piracy. But on the other hand the verb ‘to pirate’ have two definitions-

1. To appropriate or reproduce (the work or ideas etc of another), without permission for one’s own benefit.
2. To plunder

These definitions seem to be more appropriate since inherent without the bio-piracy rhetoric are the notions of unauthorized appropriation and theft. In essence, bio-pirates are those individuals and companies accused of one or both of the following arts (i) the theft misappropriation of or unfair free riding on genetic resources and or traditional knowledge through the patent system, and

\textsuperscript{35} Oxford Dictionary on the web.
(ii) the unauthorized and uncompensated collection for commercial ends of genetic resources or traditional knowledge.\(^{36}\)

**a) Bio-piracy and Bio-prospecting**

Bio-piracy or Bio-prospecting refers to unauthorized use of-

(a) Biological resources such as plants, animals and micro organisms

(b) Traditional communities' knowledge on biological resource.

Bio-piracy also denotes unequal shares of benefits between a patent holder and the indigenous community whose knowledge or resource has been used. This clearly shows that the person who commits bio piracy enjoys the maximum benefit at the cost of the indigenous people’s knowledge, as these people are unaware of the importance of their traditional knowledge. It also indicates misappropriation and monopolization of traditional population’s knowledge and biological resources unlawfully.\(^{37}\)

Meaning thereby bio-piracy can be defined as stealing the knowledge from traditional and indigenous communities or individuals. The term can also be used to suggest a breach of a contractual agreement on the access and use of traditional knowledge to the detriment of the provider and bio-prospecting without the consent of the local communities.

The action group on Erosion Technology and Concentration (ETC) Group, Canada (Former RAFI) defines it as the appropriation of the knowledge and genetic resources of farming and indigenous communities by individuals and institutions seeking exclusive monopoly control (usually patents on plant breeder’s rights) over these resources and knowledge.\(^{38}\) ‘Bio-prospecting’

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38. National Roving Seminar on Traditional Knowledge 13-14 August 2008 Dehradun
refers to the use of traditional or indigenous traditional knowledge with the
prior advanced consent of the community of the people who had preserved it
and it also concerns sharing the benefits equally with the community. 39

Biodiversity prospecting is the exploration extraction and screening of
biological diversity and indigenous knowledge, for commercially valuable
genetic and biochemical resources. While it is true that biodiversity prospecting
does not always involve the use of indigenous knowledge it is clear that
valuable chemical compounds derived from plants, animals and micro-
organisms are more easily identified and are of greatest commercial value
when collected with indigenous knowledge and or ground in territories
traditionally inhabited by indigenous people.

The newly released discussion document, ‘Bio-prospecting: Harnessing
Benefits for New Zealand’ has the following working definition for Bio-
prospecting.

Bio-prospecting is the collection of biological material and the analysis of
its material properties, or it molecular biochemical or genetic content for the
purpose of developing a commercial product. Bio-prospecting policy excludes
the later steps in the chain of product development. 40

According to legislative reference Bureau Report Bio-prospecting is the
removal or use of biological and genetic resources of any organism, mineral or
other organic substance for scientific research of any organism, mineral or
other organic substance for scientific research or commercial development.
When bio-prospecting is pursued without the knowledge and free prior consent
of the owners of the resources and without benefits shaving it is called bio-
piracy.41

39. Supra Note 37

T.K. Under CBD and Biopiracy
According to the Asean Framework agreement on Access to Biological and Genetic Resources, 2000 "Bio-prospecting: the search for wild species with genes that produce better crops and medicines, or the exploration of biodiversity for commercially valuable genetic and biological resources."\textsuperscript{42}

Before 1992 biological resources, were considered common heritage of humankind. Scientists could take samples from anywhere in the world without any specific permission. The Convention on Biological Diversity (CBD) establishes sovereign national rights over biological resources.

There is a distinct difference between bio-piracy and bio-prospecting. The term ‘bio-piracy’ describes the unauthorized and uncompensated taking and use of biological resources. In contrast ‘bio-prospecting’ refers to the search for valuable active chemical compounds in nature, and involves accessing national resources through legal means, securing prior informed consent from the custodians of the relevant natural resources and promoting equitable benefit sharing agreements with appropriate parties. Bio-piracy deprives not only the custodians of biological resources but also the country concerned.\textsuperscript{43}

The modus operandi of the MNCs had been to collect the plant varieties and their germplasms from poor countries in order to cross breed them with other varieties and claim that they had invented something novel, non-obvious and of practical use which are the requirements for acquiring patent rights and then to patent them in their own country or any other country of their choice. Thus even though India is rich in biodiversity and has a rich biodiversity related intellectual heritage, bio-piracy directs this wealth away from India and drives us our right to use resources and knowledge, for our needs and our economic benefits.

\textsuperscript{42} Ibid
\textsuperscript{43} Supra Note 38
6. Bio-piracy of Traditional Medicinal Knowledge

Nearly all cultures, from ancient times, have used plants as a source of medicine. In many developing countries traditional medicine is still the mainstay of healthcare and most of the drugs and cures used come from plants. In developed countries too people are turning to herbal remedies. Besides, modern scientific medicine still depends on plants and the knowledge gained from them, for some essential drugs. People in India and China are known to have used plants for healthcare for over 5000 years.

India is one of the world’s 12 regions having the largest biodiversity. It has 16 agro climatic zones and 45,000 plant species, of which 15,000-20,000 possess proven medicinal value. According to the World Health organization (WHO) more than one billion people rely on herbal medicine to some extent. The WHO has listed 21,000 plants worldwide, reported to have medicinal uses. It also has a rich medicinal plant flora of some 2,500 species of which at least 150 are used commercially for pharmaceutical purposes on a fairly large scale. There are four well recognized systems of traditional medicine namely, Ayurveda, Unani, Siddha, Yoga & Naturopathy and practices based on theories beliefs and experiences indigenous to different cultures and used in the maintenance of health as well as in the prevention, diagnosis and treatment of physical & mental illness. Traditional medicines have a long history and have been field tested for centuries by thousands of people, resulting in the accumulation of much empirical knowledge in the communities, passed on by generations of healers. Traditional medicine is perceived as efficient safe and cost effective. Moreover it is accessible to the poor and those living in remote areas.44

Indian system of Medicine uses around 25,000 plant species belonging to more than 1000 genera. About 800 species are used by industry of which

44. P.C Trivedi (ed.), Medicinal Plants: Traditional Knowledge, p. 120 (2007).
approximately 25% are cultivated. Despite convincing progress in synthetic chemistry and biotechnology, plants are the most important sources for preventive & creative medical preparations. WHO has estimated that at least 80% of all the global inhabitants rely on curative medical system of medicine for their primary health needs and thus systems are largely plant based. 45

Medicinal plant species are still to large extent gathered & collected from the wild and relatively few genera are cultivated on commercial scale. Along with increasing urbanization, exploitation & bio-piracy led to a steady erosion and loss of diversity from the natural habitats of these plants.

With the advent of Portuguese, British and French colonists in the Indian subcontinent a few hundred years ago, the traditional practices regarded as backward practices and created a stigma, which led to the abandoning of these ecologically sound practice in favour of modern chemical products imported from the west. But now when these developed countries took these natural resources in their laboratories & found the medicinal qualities of these resources they tried to get patent over these natural products. Being the long back practice of these products in India for medicinal and other purposes, India has an ultimate right over them.

When individuals or corporations receive freely traditional knowledge from indigenous people and convert this into private property through intellectual property right, their exchange of knowledge amounts to bio-piracy. Bio-piracy leads to drain of wealth and denies us the right to use our own biological resources for our economic benefit.

Bio-piracy allegedly contributes to inequality between developing countries rich in biodiversity, and developed countries served by pharmaceutical industry exploiting these resources the manipulation of living materials to create new types of medicines and agricultural products is

45. Ibid.
currently worth $2 billion a year in the United States. Estimates who that
biotech profits will soar to $50 billion by the year 2000. Most of the raw
material for this blooming industry comes from the world’s dwindling
rainforests of the southern hemisphere.  

Biotechnology and new patent laws have allowed companies to capitalize
on even the smallest life forms. The forms the E Merck pharmaceutical
company has patented microbial samples from nine countries. These include
soil bacteria from a heather forest on Mt-Kilimanjaro, a Mexican soil fungus
useful in manufacturing of male hormones, a fungus found in Namibian soil of
potential use in treating manic depression, soil bacteria in India that serves as
an antifungal agent and a Venezuelan soil bacteria patented for use in the
production of antibiotics. The bio-pirates are also on the lookout for profitable,
patentable plants. In one remarkable example, several North American
companies including WR Grace have been granted more than 30 US patents on
the neem tree of India and not only on the tree but also on the indigenous
knowledge about its many uses.

In another act of bio-piracy, two drugs derived from the say periwinkle—
vincristine and vinblastine earn $100 million annually for pharmaceutical giant
Elitilly. The plant is indigenous to the rainforest of Madagascar, but the country
has received nothing in return.

Intellectual property protection is dividing to tribal communities for their
medicinal knowledge because the existing intellectual property paradigm
assumes that such knowledge belongs to an anonymous individual. He or she
had acquired this knowledge by his own merit or efforts and the community
has no locus standi in this contexts. As a result the paradigm considers such
knowledge to be located in the public domain. However available data from
some tribal communities illustrate that this contention is erroneous and

47. Ibid.
simplistic. Tribal medicine is not just an aggregate of the efforts of certain individuals like allopathic medicine, homeopathic medicine and other medical care models, it is a system too.

7. Concept of Benefit Sharing and Prior Informed Consents

(a) Access and Benefit Sharing

The question of access to genetic resources and to traditional knowledge concerns the conditions under which potential user can obtain the resources or knowledge they need. Access is linked to benefit sharing insofar as establishing the knowledge or resources used in a product or process protected by intellectual property rights is a precondition for assessing who are the calamities of the benefit sharing.

Benefit Sharing involves a balance between access to genetic resources and fare and equitable sharing of benefits of their use through wide variety of monetary and non-monetary mechanisms ranging from profit sharing all equitable stakes in the bio-prospecting business and also technology transfer and collaborative research. It has been a recurrent theme in international debates for the post two decades. In the legal field, benefit sharing is a technical term used in the context of access to and use of human and non human genetic resources. Nonhuman genetic resources includes, plants, animals and micro organisms the term describes an exchange between those who grant access to a particular resource and those who provide compensation or reward for its use.

The justification for benefit sharing in the context of non-human genetic resources can be taken straight from the CBD. The CBD identified the conservation of biological diversity as a common concern of mankind (Article 15(1) the CBD indicates that compensation is due for the use of genetic

T.K. Under CBD and Biopiracy

resources. World leaders meeting at the 2002 World Summit on Sustainable Development in Johannesburg South Africa agreed that the distraction of biological diversity would continue unabated unless the custodians of this natural wealth benefit from this conservation. Compensation is therefore due for any use of resources or knowledge whether for research commercial or other purposes.

Context of CBD and PGRFA, Treaty the sharing of benefits, is to be fair and equitable. Benefit sharing has after been conceived as a form of financial compensation. This monetary benefit can take the form of access fees, royalty payment, license fees or contributions to be paid to special financial mechanisms setup for this purpose.

Without fair benefit sharing, the conservation and sustainable use of non-human genetic resources will continues to be at risk. Thus it can be said that benefit sharing is the action of giving a portion of advantage profit derived from its use of non human genetic resources or T.K. to resources provider, in order to achieve justice in exchange. Therefore if one uses resources one does not own then justice demands some form of compensation in exchange access and benefit sharing stake holders.

Access and Benefit Sharing (ABS) has emerged as the most complex issues where the UN-CBD and WTO came on a direct confrontation. Both TRIPS Council of WTO and the Conference of Parties (COP) to CBD have been considering ironing out these contradictions. CBD began to address the ABS issues and their implementations since the Fourth Meeting of the COP held in Bratislva in 1988, which finally led to the development of 'Bonn Guidelines' in October 2001. The Bonn guidelines provide the parties stakeholders with a framework to facilitate access to genetic resources and ensure fair and equitable

49. Id., Article 1
sharing of benefits through standard practices and procedures of Prior Informed Consent (PIC), Mutually Agreed Terms (MAT) and other relevant agreements. The Guidelines provide details of an overall strategy and essential steps, elements and principles to be adopted in developing ABS regime by parties and stakeholders.

"Benefit-sharing is an important component in any ABS or technology transfer contracts involving genetic resources and associated TK. MAT in accordance with Article 15.7 of UN-CBD should pay adequate attention to reaching an agreement on fair and equitable sharing from the commercial or other utilization of the resources ire the TK accessed. The benefit-sharing mechanisms and formula may significantly vary depending upon for the purpose for which the genetic resources and TK are accessed. The monetary benefits (e.g. license fees, royalties) need to be fixed depending upon the actual capital inputs including human resources inputs and intellectual inputs provided by the participating countries in any joint prospecting bio-partnership programmes. Although the Bonn guidelines provide a conceptual as well as practical framework for ABS, a coherent framework for benefit arising from sustainable use of genetic resources, and traditional knowledge is almost impractical. Therefore there is a need for the Like-Minded Megadiverse Countries (LMMC) and other regional groups of biodiversity rich countries to strengthen collaborative partnership among their members to build up capacity building in all relevant areas of biodiversity, biotechnology, intellectual property, information management, etc. Such regional cooperation would be helpful to develop national legal and policy frameworks on ABS and to harmonize the various statutory mechanisms through conscientious discussions, besides developing a joint strategic action plan to deal with all ABS and related issues at international forums.
India has the distinction of being the first in the world in experimenting a benefit-sharing model that implemented Article 8 (j) of CBD, in letter and spirit. It was the Tropical Botanic Garden and Research Institute (TBGRI), Kerala that demonstrated indigenous knowledge system merits support, recognition and fair and adequate compensation.

In this case, the bio-prospectors were a team of biologists farm Tropical Botanic Gander and Research Institute (TBGRI) on an Ethrobatanical research expedition. They were not looking for Arogyappacha plant directly but were intrigued by the fact that the kani guides they had hired were not feeling fatigued at all. They eventually persuaded some of the local kani people to share their knowledge with them. This was a clear case of transfer of traditional knowledge to outsiders who know neither about the plant nor its properties this led to the development to drug with ant fatigue properties, called Jcevari. TBGRI decided to give 50 percent of the fee and royalty to kani people.

The TBGRI model got wide acclaim, acceptance and popularity the world over, because it was the first of its kind that recognized the resources rights and IPR of a traditional community by way of sharing equitably the benefits derived out of the use of a knowledge that has been developed, preserved and maintained by the community for many generations. Such models need to be emulated in similar situation in India and elsewhere in the world.

(b) Prior Informed Consent

Biological diversity is essential for our planet, human well-being and to the livelihood and cultural integrity of people. Its gradual loss, as a result of a number of factors, represents a silent emergency that threatens to undermine efforts to eradicate poverty and achieve sustainable development throughout the world.
The 1992 Convention on Biological Diversity provides a comprehensive framework for stopping that loss. It is a carefully balanced, legally binding international treaty that commits its Parties to the triple objective of conserving biological diversity, using natural resources sustainable, and fairly and equitably sharing benefits deriving from the use of genetic resources.

The Convention addresses the terms and conditions for access to genetic resources and benefit-sharing. It recognizes the sovereignty of states over their natural resources and provides that access to these resources shall be subject to the PIC of the contracting party providing such resources. It also provides that access shall be based on MAT in order to ensure the sharing of benefits arising from the commercial or other utilization of these genetic resources with the contracting party providing such resources.

Although the Convention of Biological Diversity was adopted in 1992 and entered into force at the end of 1993, it was not until 1999 that work began in earnest to operationalize these provisions. The result is the Bonn Guidelines on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits arising out of their utilization, so named because of the location of the intergovernmental meeting in October 2001, that prepared the first draft, which was eventually adopted, with some changes, by the conference of the Parties to the convention at its sixth meeting, held in the Hague in April 2002.

The guidelines identify the steps in the access and benefit-sharing process, with an emphasis on the obligation for users to seek the PIC of providers. They also identify the basic requirements for MAT and define the main roles and responsibilities of users and providers and stress the importance of the involvement of all stakeholders. They also cover other elements such as incentives, accountability, means for verification and dispute settlement.

52. CBD Article 15
Finally, they enumerate suggested elements for inclusion in material transfer agreements and provide an indicative list of both monetary and non-monetary benefits.

Although they are not legally binding, the fact that the Guidelines were adopted unanimously by some 180 countries gives them a clear and indisputable authority and provides welcome evidence of an international will to tackle difficult issues that require a balance and compromise on all sides for the common good.

Basic principles of a PIC system as laid down in Bonn guidelines, includes legal certainty and clarity. It laid down that access to genetic resources should be facilitated at a minimum cost and the restriction on access to genetic resources should be transparent and should be based on legal grounds and should not run counter to objectives of CBD. It also laid down elements of a PIC system which held that there should be a mechanism for obtaining PIC in consultation with relevant stakeholders and there must be a competent authority to grant or provide for evidence of PIC. It lays down that PIC must seek adequately advance to be meaningful both for those seeking and for those granting access. Decisions on application for access to genetic resources should also be taken within a reasonable time period. It also pointed to and important fact that prior informed consent should be based on the specific uses for which consent has been granted. While prior informed consent may be granted initially for specific use, any change of use including transfer to third parties may require a new application for prior informed consent. Permitted uses should be clearly stipulated and further prior informed consent for changes or unforeseen uses should be required.

NIF, an autonomous society established under the Department of Science and Technology, Government of India in 2000, works for recognizing, respecting and rewarding innovations and outstanding traditional knowledge at
the grass roots. NIF and the HONEY BEE Network under SRISTI\textsuperscript{54}, Ahmedabad, has been scouting for documenting local innovations and linking their innovations for further valorization with Science and Technology experts, investors and entrepreneurs.

NIF has developed a model for facilitating PIC system for local innovators and traditional knowledge holders. The PIC models seek the innovators' or traditional knowledge holders' consent for partial or full disclosure of their innovation and disseminate them through print and web media, and provide NIF mediation for value addition, patenting or other kinds of IPR generation based on the local innovation or traditional knowledge, and for fixing criteria and the terms and conditions for sharing monetary or non-monetary benefits, if any, arising from the value addition, micro-venture development, patenting on a local innovation or traditional knowledge, and for fixing criteria and the terms and conditions for sharing monetary or non-monetary benefits, if any, arising from the value addition, micro-venture development, patenting on a local innovation or traditional knowledge. The PIC process with regard to traditional knowledge holder and other grass root innovations is a quite complex one. This cannot be compared with the formal PIC process recommended for other ABS model involving Government agencies, R&D institutions and other organizations. The awareness, capacities and exposure level of the local innovators to the modern regimes of IPR scientific validation, management, trade policies, etc. is either minimum or low. Empowering these communities with knowledge and awareness on the values and potentials of the rich treasure-trove of knowledge they hold is an important exercise, which NIF has been successfully accomplishing through their scouting programmes, awareness campaigns, competitions and awards distributions conducted for successful innovators.

However, the whole process of disclosure and dissemination of the local innovations, either partially or fully, needs to be examined, whether they affect

\textsuperscript{54} Available at www.sristol.org/honeybee.html
adversely in eventual exclusion of potential innovations from possible valorization and IPR claims and also any possible misappropriation of such potentially useful innovations by others, and thereby depriving the local innovator of his/her intellectual property and customary rights.

An important issue regarding PIC is that of whose "consent" is required to be obtained when the term PIC is used. The consent of the authority under the relevant national law is required in most international debates. This aspect would however create problems as the actual custodian of the biological resources and associated TK would be the TK holder, and in most cases it is a local or indigenous community, or member of such communities. The CBD talks of PIC in terms of PIC of the contracting party providing biological and genetic resources. This is perhaps an inevitable outcome of an international convention aimed at *inter se* rights and obligations of state parties rather than the rights of individuals or communities within their territory.

There are three variants regarding the involvement of the local and indigenous communities in the process of gaining access to biological resources. The *first* forms the basis of guidelines for bio-prospecting adopted by the Philippines in its Executive order No. 247\(^{55}\), it puts the local and indigenous communities in the key decision making role as regards access to biological resources. The *second* variant is OAU Model\(^{56}\), which lay down that the consent of local and indigenous communities can be obtained subject to written PIC of the concerned traditional communities, as well as, from the national competent authority set up to implement the legislation. Third variant is the one that has been provided in Decision 391 of the Andean community\(^{57}\), it lays down that

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55. Krystyna Swiderska, "Developing the Philippines Executive order No.247 on access to Genetic Resources", available at www.cbd.int/doc/casestudies/abs/cs-abs
competent national authority should not only determine access but should also enter into contractual arrangements within the prospective users of biological material, however, the interest of local and indigenous communities should also be kept in view.

The Indian legislation, the Biodiversity Act 2002, does not explicitly bring the traditional communities into the decision-making regarding access. Access to biological resources can be obtained by referring to be National Biodiversity Authority (NBA) the setting up of which has been provided for in the legislation.

In conclusion it can aptly be said that such legislations should be implemented that may allow communities themselves to exercise control over their knowledge and resources. Principles of equity and justice demand that the actual TIC holder's should not be substituted by a government agency as their interest may always be the same. However there may be different problems in achieving such an ideal, such as

(a) Problem may arise as most of the local and indigenous communities do not have right and control over the land in which they stay.

(b) There has been disintegration of the bonds within a local community owing to sociological and economic forces. Thus, it may not be always possible to identify one specific community as the holder of TK.

(c) The other difficulty is that of conflict in interests between the TK holder and the political head of the community due to difference in hierarchical equations. This can be seen in the cases where the local and indigenous communities may have feudal structures of governance which may create a power imbalance and may impede the benefits from reaching the actual TK holder.
Thus, there is a need to evolve a mechanism for access to biological resources that may provide a balance between the two systems that the countries have proposed or adopted in their legislation. Therefore, it can be suggested that the NBA should include more stakeholders from amongst the traditional communities so that its representative character can be improved.

The Biodiversity convention is the basic treaty concerning the regulation of access to biological and genetic resources and benefit sharing along with this other guidelines and treaties are there to take about the benefit sharing aspect.

(a) **Bonn Guidelines:** In 2002, guidelines on access to genetic sources on equitable sharing of the benefits were of the Bonn Guidelines is to increase transparency and certainty in access procedures so as to foster access by users of biological resources and traditional knowledge. On benefit sharing aspect Bonn Guidelines includes a number of suggested ways in which benefit sharing can be conceived this includes monetary and non monetary benefits. Monetary benefits include access fees, the payment of royalties research funding and joint ventures. Non monetary benefits include the sharing of research and development results, participation in product development, training related genetic resources and access to scientific information relevant to conservation and sustainable use of biological diversity.

(b) **International Treaty on Plant Genetic Resources for Food and Agriculture’s Regime**

Under the PGRFA treaty, benefit sharing is a direct consequence of facilitated access and is meant to provide an incentive for countries to provide

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access to other member states. With regard to monetary benefits, the treaty provides that recipients who commerical a product incorporating an accession from the multilateral system must pay an equitable share of the benefits.\textsuperscript{59} The benefits that arise under the benefit sharing arrangement must be primarily directed to farmers who conserve and sustainable use plant genetic resources for food and agriculture the treaty provides that it is use which triggers the benefits arrangement and not only commercial use. Article 13(2) (ii) includes a clause which significantly narrows down the scope of provision for the sharing of commercial benefits. Under this provision, the obligation to sharing entity has a monopoly right such as patent.

In India benefit sharing schemes have been separate Act and the Biodiversity Act.

\textbf{(c) Benefit Sharing under the Plant Variety Act, 2001}

Under section 26 which regulates benefit sharing the substantive bases for a benefit sharing claim are the extent and nature of the use of genetic material of the claimant in the development of a variety and the commercial utility and viability as well as demand in the market for the variety.\textsuperscript{60} Elements taken into account include the contribution of the claimant in selecting, conserving and providing the genetic material, the contribution of the genetic material in providing one or more traits which confer high commercial value to the variety, and the contribution of the hybrid variety.\textsuperscript{61}

Claims for benefit sharing can be made by a single person, a group of persons or even a non-governmental organization.\textsuperscript{62} Claim must be brought forward within six months from the date of publication of the certificate of registration. In case of disagreement, the breeder is entitled to oppose the

\begin{footnotesize}
\begin{itemize}
\item 59. PGRFA, Treaty Article 13 (2) d,
\item 60. Protection of Plant Varieties and Farmers Rights Act, 2001. Sec. 26(5),
\item 61. Protection of Plant Varieties and Farmers Rights Rules, 2003. Sec. 43,
\item 62. Id. Sec. 41(2)a,
\end{itemize}
\end{footnotesize}
claim. The plant variety Authority is left to take a decision on the basis of claims and oppositions.

The Authority plays a central role in the determination of benefit sharing because neither the Act nor the Rules specify what percentage of benefits is be shared.

While benefit sharing is only dealt with under section 26, the act includes another compensation scheme under section 41. The first distinction between section 26 and section 41 is that the former provides a mechanism which works well in situations where the certificate of registration specifically indicates the geographical origin of a variety while the latter is geared towards situations where individuals or communities become aware that they have a claim to benefit sharing even though their contribution was not mentioned.

Section 41 also differs from section 26 insofar as the procedural conditions for claims are less stringent and for instance; do not include either a time frame for the claim or a requirement to pay a fee. Moreover, the grounds for granting compensation are different from section 26. While the latter focuses only on the use of the variety compensation is to be awarded where the contribution is significant though the threshold for significance is not defended.

Amounts awarded by the Authority as benefit sharing and compensation are to be paid to a National Gene fund. The Gene Fund is to be applied to generally support and reward farmers for their contribution to conserving and improving plants, to initiate capacity building measures on conservation at the local level and to pay amounts due as benefit sharing and compensation. The Biodiversity act does not refer at all to the concept of prior informed consent. It provides for prior approval of the National Biodiversity Authority which can be understood as a weak form of the principle of prior informed consent.

63. The definition of benefits sharing under section 2 specifies that it only applies to section 26.
Under the Biodiversity Act, the access and benefit sharing regimes are directly linked. In fact, the Authority must ensure while granting access that the conditions under which access is provided ensures an equitable sharing of the benefits arising out of the use of accessed biological resources and derived products.\textsuperscript{64} While the Biodiversity Act introduces a number of different types of benefits that can be shared, there is still an important emphasis on monetary benefits and it cannot be ruled out that most transactions will take the form of monetary compensation. Where monetary compensation is chosen, the Authority has the discretionary power to have the sum deposited in the National Biodiversity Fund set up under the Act or paid to specific individuals or groups of individuals in situations where the origin of the biological resource can be specifically traced.

8. Relevant Case Studies

(a) Indian Cases

In India, where the awareness of intellectual property law is very low, the momentum towards protection of the indigenous properties increased after the Basmati turmeric and neem disputes. THE turmeric case, in which India succeeded in overturning a patent granted by the United States Patent and Trademark Office on turmeric powder, was a land mark in the battle against ‘bio-piracy’. It was the first case in which a Third World country succeeded in its objection to a foreign patent on the grounds that it was based on traditional knowledge known to the country for generations. By this, the attempt to secure a monopoly on turmeric powder for use in wound healing was defeated. This case threw into prominence some of the main issues concerning the position of traditional knowledge of scientific importance under the patents regime, and also highlighted the difficulty in protecting knowledge that was known for centuries, but which was not articulated in a form found within Western

\textsuperscript{64} Biological Diversity Act, 2002. Sec. 21 (1).
cultural paradigms. A number of consequences have followed from this case, one of which has been the effort to record the traditional knowledge of India, in an attempt to ensure that similar patents are not granted again anywhere in the world. Few cases of biopiracy in India are as under:

(i) THE TURMERIC PATENT CASE

Two U.S. based Indian nationals Suman K. Das and Hari Har P. Cohy were granted U.S. Patent No. 5,401,504 on 28 March 1995 on the “Use of Turmeric in Wound Healing”, which was assigned to the University of Mississippi Medical Centre, U.S.A.\(^{65}\)

The media coverage of the patent generated debate and discussion on the issue, and the Council of Scientific and Industrial Research (CSIR), an autonomous institution under the Department of Science and Technology, Government of India, decided to file for re-examination of the patent. There were many challenges before them. The claimed subject matter was the use of "turmeric powder and its administration", both oral as well as locally applied, for wound healing. It was therefore necessary to find adequate evidence in the form of printed and published information that would constitute prior traditional use of the claimed invention. The biggest challenge before CSIR was, that despite the fact that the use of turmeric was known to every Indian household for ages, finding documented information on the use of turmeric powder per se through oral as well as topical route for wound healing was a tough task.

After an extensive search, thirty-two references were located, some of which were more than one hundred years old, and in the languages of Sanskrit, Urdu and Hindi. These were then translated, and authenticated as being true translations.\(^{66}\) They were then field as part of the re-examination request, which was admitted by the USPTO as raising substantially new questions of

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patentability. The turmeric case failed to meet the novelty criteria the USPTO upheld the objections raised and cancelled the patent.

Though, the Turmeric case was a success story, it also revealed a variety of problem areas in challenging what was obvious to people in India, based on the laws of a foreign jurisdiction. The lessons learnt and problem areas as identified by the CSIR after the Turmeric experience can be summarized thus:

a) There is a wide gap in the availability of information for patent examination purposes relating to TK bases from third-world countries. This needs to be documented and put into the public domain to discourage the grant of patents based on the centuries-old use of natural product from biodiversity-rich regions of the world;

b) It may not be feasible to make such an investment (of filing for re-examination) each time where an "invention" is claimed on a biological resource and its traditional use, challenging a large number of patents would mean wasting money and time. The commercial impetus to take up such cases is a grey area. Whether it should be the responsibility of the State to take up such cases in the future whenever there are no private entities willing to initiate action is a question to which there are no clear answers. The "affected interest' may not be easily tracked unless there is a substantial market potential for the patented product;

c) The ex parte nature of the proceedings throws up further challenges in that the re-examination field for should be self-explanatory and clear. There is no scope for an oral hearing or classifications when the process of re-examination is ongoing.

(ii) Neem Patent Case

The patent No. 0436257 B1 was granted to the United States Department of Agriculture and the multinational corporation W.R. Grace for the
fungicide derived from seeds of Neem Tree. The main claim of the patent was: "A method for controlling fungi on plants comprising contacting the fungi with a neem oil formulation containing 0.1 to 10% of hydrophobic extracted neem oil which is substantially free of azadirachtin, 0.005 to 5.0% of emulsifying surfactant, and 0 to 99% water.

In June 1995, a legal opposition against the grant of this patent was filed in the European Patent Office (EPO) by the three groups i.e., the Delhi-based Research Foundation for Science, Technology and Ecology, the Green Party in the European Parliament, Brussels, and the International Federation of Organic Agriculture Movements (IFOAM), based in Germany in solidarity with the Neem Campaign.

The main grounds of opposition to the present patent was that the claimed fungicidal effect of hydrophobic extracts of neem seeds was known and used for centuries on a broad scale in India, as a pesticide, medicine as well as fertilizer. In Ayurvedic medicine, to cure dermatological diseases and in traditional Indian agricultural practice, to protect crops from fungal infections. This traditional Indian knowledge was in fact known to Indians since ancient times, after testimony from an Indian business that had been using neem for the same purpose years before they asserted that the patent in question lacked two basic statutory requirements for the grant of a European patent namely "Novelty" & "Morality". (Article 54 of the European Patent Convention (EPC) lays down requirements of novelty.

(1) An invention shall be considered to be new if it does not form part of the state of the art.

68. Ibid.
(2) The state of the art shall be held to comprise everything made available to the public by means of a written or oral description, by use, or in any other way, before the date of filing of the European patent application.

The opposition division of the EPO revoked the patent in 2000 after opponents successfully argued that there was prior public use and that claims therefore not novel. The second ground that was raised was that the patent was contrary to "morality" Article 53(a) of the EPC, because the so-called inventors claimed monopoly property rights on a method which forms part of the TK base of India-in essence stealing it, and theft is regarded as immoral in European culture.

The Neem Campaign mobilized worldwide support to protect indigenous knowledge systems and resources of the Third World from piracy by the West, particularly in light of emerging threats from intellectual property rights regimes under WTO and TRIPS.

The Neem patent was the first case to challenge European and US patents on grounds of bio-piracy. This patent was revoked on the 8th of May, 2005 by the EPO.

(iii) Basmati Rice Patent Case

Rice Tec Inc, was issued the Patent number 5663484 on Basmati rice on September 2, 1997. This caused grave repercussions for India and Pakistan because not only India lost out on the 45,000 tons US import market, which formed 10 percent of the total basmati exports, but also its position in crucial...
markets like the European Union, the United Kingdom, Middle East and West Asia.\textsuperscript{73}

Basmati is a long aromatic kind of Indian rice, the name basmati has been derived from Hindi word for fragrance which seems to be an appropriate connection with the aromatic scent of the basmati rice. It has a particular class and it has at least 400 varieties available in India & Pakistan.\textsuperscript{74} Rice is an important aspect of life in the Southeast and other parts of Asia. For centuries, it has been the cornerstone of their food and culture. The farming communities throughout the region developed, nurtured, and conserved over a hundred thousand distinct varieties of rice to suit different tastes and needs. It was for this reason that patenting of Basmati by Rice Tec Inc. was perceived as not only intellectual property and cultural theft, but it was also directly threatened the farming communities in Southeast Asia. The Government of India reacted immediately after learning of the Basmati patent issued to Rice Tec Inc. and stated that it would approach the US patent office and urge them to re-examine the patent to a United States firm to grow and sell rice under the Basmati brand name in order to protect India's interests, particularly those of growers and exporters. Furthermore, a high inter-ministerial group comprising of representatives of the ministries and departments of commerce, industry, external affairs, Council for Scientific and Industrial Research (CSIR), Agriculture, Bio-technology, All India Rice Exporters Association (AIREA), APEDA and Indian Council of Agricultural Research (ICAR) were mobilized to begin an in-depth examination of the case.\textsuperscript{75} The contents and implications of the patent are currently being analyzed in consultation with patent attorneys and agricultural scientists. In the presence of widespread uprising among farmers and exporters, the nation of India as a whole has felt confident of being able to

\textsuperscript{73} P.Ramchandran, “Challenging the Basmati Patent” available at http://www.thehindu.com/line/11710/17100790.htm
successfully challenge the Basmati patent by Rice Tec Inc. However, judgment on these issues is awaited with interest.

Sagar and Suri from a law firm representing India in the dispute, criticized the procedures for granting patents in the US claimed it diametrically opposite to the one followed in India and Europe\(^7\). According to them, India first examines a patent application, then widely publishes it for third parties to challenge, and only then grants the patent. On the other hand the US keeps the patent application a closely guarded secret and grants it without allowing other parties to challenge it. After grant of patent third parties are allowed to petition against the patent as India is currently doing in the Basmati case. This criticism clearly illustrates the shortfalls in the patent process in the US that ultimately needs to be revised to prevent future cases like this from occurring.

(iv) Wheat Patent Case

Wheat the Golden grain is called "Kanak" in North Western India. It is the staple of a large majority. Wheat diversity has been evolved by Indian farmers over millennia for taste, for nutrition, for ecological adaptation to cold climates and hot climates, dry regions and wet regions.

On 21\(^{st}\) May 2003, the European Patent Office in Munich granted a patent to Monsanto better known as the world’s largest trader in genetically engineered plants, with the number EP 445929, with the simple title "plants", even though plants are not patentable in European Law. The patent covers wheat exhibiting a special baking quality, derived from native Indian wheat with the patent, Monsanto holds a monopoly on the farming, breeding, and processing of a range of wheat varieties with low elasticity.\(^7\)

\(^7\) Francois Meinbert, “Basmati rice update” available at http://www.biotech_info.net/basmati_rice.htm

The wheat variety which has been pirated from India has been recorded as NapHal in the gene banks from which Monsanto got the wheat and in Monsanto’s patent claims. The name NapHal is not the name of an Indian variety. Indian varieties were fully documented by Howard in “Wheats of India”. NapHal means “no seeds”, and is not, and cannot be an indigenous seed variety because farmers bred seed to produce seed.\(^78\)

NapHal is the name given by W. Koelz, USDA. However, Koelz clearly did not make the collections himself, but was handed over the varieties, since the locations are inaccurate. Thus, the discrepancy in the location and in the name indicates that the variety referred to as “NapHal”, was pirated, not collected.

Vandana Shiva, Director of Research Foundation for Science, Technology and Ecology (RFSTE) has challenged Monsanto wheat bio-piracy both in the Indian Supreme Court and in the European Patent Office in Munich with Greenpeace. She submitted to the EOF on 17\(^{th}\) February 2004 that “The patent is a blatant example of bio-piracy as it is tantamount to the theft of the results of endeavors in cultivation made by Indian farmers. In the countries of the southern hemisphere, it is frequently the small farmers who make a decisive contribution to agricultural diversity and secure sufficient food supplies by freely swapping seeds and breeding regionally modified forms of crops…”\(^79\)

Monsanto thus has unscrupulously exploited the fruits of the farmers. The company is able to restrict not only the farmers and processing of crops, but also trade in crops, in the countries for which the patent has been granted. At the same time it can block the free exchange of the seed, thus preventing other growers and farmers from working with the patented seeds.

Thus, this case highlights the fact that if such bio-piracy based patents are not challenged and crop lines and products based on unique properties

\(^78\). Ibid.
\(^79\). Ibid.
evolved through indigenous breeding became the monopoly of MNC's, in future we will have to pay royalties for our innovations especially in light of the Patent Cooperation Treat and upward harmonization of patent law.

Monsanto's wheat bio-piracy patent should be a wake up call to citizens and governments of the world. It is yet another example of why the TRIPS of WTO need to be changed, and why traditional knowledge and community rights need to be legally recognized and protected.80

(v) Benefit-Sharing Arrangements with the Kani Tribes of Kerala

Below mentioned case study is related to the benefit sharing arrangement that has been made between the Tropical Botanical Garden and Research Institute (TBGRI) a publicly funded research institute based in Trivandrum and the Kani tribes of Kerala, involving the medicinal plant called arogyapaacha (Trichopus zeylanicis). The Kani tribes were using the fruit of this plant as an instant source of energy and vitality. The know-how about the plant was provided by three Kani tribal members to the team of TBGRI scientists during a research operation in the forest areas inhabited by the Kanis.

Detailed scientific investigation of the plant was subsequently carried out by the TBGRI, including chemical screening to isolate the active principles, and pharmacological screening. The TBGRI scientists developed a drug, "Jeevani", by adding three other medicinal plants as ingredients.

In a separate resolution approved both by the Governing Body and the Executive Committee of the TBGRI, it was decided that the Kani tribes would receive 50 percent of the license fee, as well as 50 percent of the royalties obtained by the TBGRI on sales of the drug, as part of the benefit-sharing arrangement for divulging the information. In November 1997, with the

80. Ibid.
assistance of the TBGRI, a trust was registered, under the name of Kerala Kani Samudaya Kshema Trust comprising of nine members. All the nine registered members of the Trust were Kani tribesmen. The president and vice-president of the Trust were the two Kanis who imparted the traditional knowledge to the TBGRI regarding arogyapaacha. The objectives of the Trust are:

a) welfare and development activities for Kanis in Kerala;
b) preparation of a biodiversity Register to document the knowledge-base of the Kanis; and
c) evolving and supporting methods to promote sustainable use and conservation of biological resources.

A first payment of US$ 13,000, and royalties of US$ 500 for the benefit-sharing formula, was deposited in the account of the Kani Samudaya Kshema Trust at Kuttichal Union Bank.

The case involving the Kanis appeared to be a solution towards the evolution of a framework for benefit-sharing with traditional communities at the first instance. However, this case also threw up its usual share of problems. Kanis from other areas expressed their misgivings about the arrangements, especially in relation to the fact that the TBGRI had not consulted them. From the TBGRI’s point of view, there was no legal requirement, and they were not told of any customary requirements for seeking the permission of the medicinal practitioners among the Kanis before using the plant. Further, the Kanis according to them were not an organized
community with an identifiable governance structure, which could have been approached for permission.

B. International Cases

(i) The Hoodia Case

The San tribes of the Kalahari are among the oldest communities in Southern Africa. They are holders of traditional knowledge on the use of Hoodia gordonii, a succulent plant found in the Kalahari desert, which they have historically consumed to stave off hunger on their long journeys. The San peoples were initially unaware that the South African Council for Scientific and Industrial Research (CSIR), an arm of the South African government, had been granted a patent on P57, an appetite suppressant derived from an extract of the Hoodia succulent through research carried out by the CSIR, and had plans to commercialize a Hoodia pharmaceutical product without their consent or their sharing of the benefits derived from the patent and commercialization.

With the involvement of NGOs, the San people and the CSIR negotiated one of the first benefit sharing agreements that gives the San people a share of royalties derived from the sale of products containing the patented P57. Although the agreement has received criticism, it serves as an example for potential future benefit sharing agreements and other mechanisms to ensure that traditional communities receive recognition for their knowledge and gain a fair share of the commercialization of the products based on such knowledge.

The case serves as an example of the necessity of ensuring PIC of traditional knowledge holders and, in cases where such prior informed consent has been achieved and a patent or other form of intellectual property is granted over elements derived from biodiversity of which traditional

84. Ibid.
communities are knowledge holders, ensuring that the benefits of their commercial exploitation are equitably shared.

The Hoodia case also highlights the need to ensure that the national legislation with respect to the biodiversity provides adequate recognition to the rights of traditional communities, in accordance with the principles and objectives set out in the CBD and the Bonn Guidelines. The Hoodia case highlighted the fact that South Africa currently lacks a regulatory framework that can properly ensure the legal protection of the rights of the rural communities over biodiversity, including recognition of PIC and protection of traditional knowledge. In this regard, it is important to ensure that adequate legislation is developed, whether based on the intellectual property system or a *sui generis* model.

(ii) **Shaman Pharmaceuticals Case**

Shaman Pharmaceuticals, a company located in San Francisco (USA), is integrating indigenous knowledge, modern science and reciprocity into Novel Drug Discovery Approach and focusing on isolating bio-active compounds from tropical plants, particularly those which have history of medicinal use.

Its field research teams consist of ethno-botanists, western trained medical doctors, local botanical collaborators, indigenous healers and herbalists. These teams assist in focused selection and collection of plant candidates for screening and development from various locations for further work in Sharman. Their community reciprocity strategy for sharing of benefits is driven by the expressed needs of the people from the communities they derive their collaborators. This includes short, medium and long-term reciprocity arrangements.

(a) Short-term compensation included building an airstrip extension in

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the Ecuadorian Amazon, organizing public health workshops and forest conservation workshops, offering direct medical care to their partner communities and providing clean drinking water systems to communities in Ecuador and Indonesia.

(b) Medium term approaches have been to provide scholarships and fellowships to scientists working in the field of traditional medicine and also to enhance infrastructural features for research in science and technology for the community.

As part of their long-term strategy, the company has formed a Healing Forest Conservancy as a nonprofit organization dedicated to conserve cultural and diversity, and sustain the development and management of natural and biocultural resources that are part of the heritage of native populations.

(iii) Collecting Traditional Medicines In Nigeria

In 1992, three U.S. agencies undertook a programme to collect and experiment on plants and traditional medicines throughout the world. The agencies, the National Cancer Institute, the National Science Foundation and the U.S. Agency for International Development, joined together to form an International Co-operative Biodiversity Group (ICBG) programme.86

One of the project teams under the ICBG programme working in Nigeria devised an interesting arrangement for sharing the benefits arising out of the bioprospective that the programme had undertaken. The team members agreed to a three-part arrangement for compensating the local people for the traditional knowledge.

I. The team was to ensure that specific monetary benefits went to the communities at each stage of its research;

II. Representatives from these communities were to decide how this money would be spent; and

III. A legal trust was to be created to ensure that the decisions taken by the representatives were actually implemented.

The monetary benefits to the local communities were to be provided initially from the project funds. After that the royalties earned by the project by making the technologies available to commercial enterprises were to be shared with the communities, with the latter getting at 25 percent share.\(^8^7\) Fifty percent of this share was to be provided to the local government in whose jurisdiction the project lay, with the other half going to the town or village where the project was located.\(^8^8\) Besides these arrangements, the team was to also provide 5 percent of all commercial drug profits to all projects in the particular region of Nigeria where the project was based in order to promote rural health, traditional medicines and biodiversity conservation. The drug company had also to agree to provide the drug at an affordable cost to all Nigerians afflicted with the disease for which the drug was the cure.

In this case it appears that ICBG tem had provide a structure for realization of the objective of benefit-sharing, even though questions may be asked about the magnitude of payments and the likely beneficiaries of this arrangement. The issue seems to be the most relevant, since given the structure of benefit-sharing that was proposed but it does seem that the communities themselves would not have got any substantial monetary benefits.

(iv) The In Bio-Merck Agreement

In this case the two organizations the National Institute of Biodiversity of Costa Rica (INBIO) and the pharmaceutical manufacturer Merck Sharp and

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88. Ibid.
Dohme, head quartered in the United States, were involved. The Agreement entered into by the two organizations in 1991 was the first formal attempt to include benefit-sharing arrangements. The parties to the contract agreed to collaborate in the investigation of the existent biodiversity in Costa Rica's tropical forests in order to establish its potential applications to human and animal health.

Under the terms of the Agreement, INBIO had the following obligations:

(a) to establish the necessary facilities in Costa Rica for the collection and processing of plants, insects and environmental samples;

(b) to provide Merck Sharp and Dohme with a specific number of plants, insects and environmental samples for a period of two years; and

(c) to provide for processing of the samples of plants and insects in a laboratory established by INBIO at the University of Costa Rica.

The corresponding obligations of Merck Sharp and Dohme were the following:

(a) Merck was to provide INBIO with a research fund of USS 1 million during the first two years of the Agreement and was to contribute to the establishment of laboratories needed for processing of the samples at INBIO and at the University of Costa Rica;

(b) Merck was to make an assessment of the samples provided by INBIO through biological experiments owned by Merck to detect potential activity of compounds for use on human and animal health and agriculture; and Merck was to give unique numeric identification to all samples sent by INBIO and was to keep an identification system which would allow the parties to the contract to identify all products from which there was a possibility of obtaining royalties.


90. Ibid.
The NBIO-Merck Agreement provided that all inventions arising from the samples supplied by INBIO would belong to Merck. Consequently, the patents on these inventions were also to be taken out by Merck.

Although the INBIO-Merck case was the first significant case of benefit-sharing involving the supplies of genetic resources and the commercial interests, the single most noticeable lacuna was the absence of any involvement of local communities. Not only were the local communities not involved in the process of formalization of the Agreement, there was no explicit arrangement to share the benefits according to INBIO with the communities.

(v) Brazzein Berries Case

Brazzein is a sweet-tasting protein extracted from the West African fruit of the climbing plant Oubli. The plant grows in Gabon and Cameroon, where the fruit has been consumed by the apes and the natives for a long time.

The Texas companies Prodigene and Nectar Worldwide were among the licensees to use Wisconsin Alumni Research Foundation patents on brazzein, and genetically engineer the enzyme into maize.\(^{91}\)

Despite the fact that the sweet taste of the berries was well known in West Africa, the university claims that their production of the sweet compound (brazzein) is its own invention and they don't owe anything to the people of West Africa as they are not legally required to do so. This fact, which involved appropriation of legal rights by means of patents over indigenous biomedical knowledge without compensation to the indigenous groups, is considered by Genetic Resources Action International (GRAIN), Geneva and Green Peace of an act of Bio-piracy\(^{92}\).

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92. Ibid
(vi) The Enola Bean Patent

U.S. Patent No. 5,894,079, the Enola bean, or yellow bean, patent was granted to John Proctor, the President of seed company POD-NERS, LLC, after he brought the bean seeds back from Mexico. With the patent granted, Proctor has an exclusive monopoly on yellow beans and can exclude the importation or sale of any yellow bean exhibiting the yellow shade of the Enola beans. The International Center for Tropical Agriculture CIAT is legally challenging the patent, arguing that the patent claims are invalid, failing to meet novelty and non-obviousness requirements and disregarding available prior art. The USPTO has yet to rule on the re-examination.

Proctor planted the yellow beans in Colorado and allowed them to self-pollinate. By selecting yellow beans in several generations, a segregating population resulted in which the color of the beans is uniform, stable and changes little by season. Proctor openly admits the Mexican origin of the beans. However, he believes that his seeds are patentable because a new yellow shade was obtained and this shade, coupled with the bean being grown in the United States for the first time, is sufficient to satisfy the novelty requirement. It is difficult for many to understand how this patent could have been granted when its novelty appears to be based solely on its color and that it was previously never grown in the United States. It raises serious issues such as whether a color can be patented and how the novelty requirement can be satisfied when these beans, that Proctor bought while vacationing in Mexico, have been grown for centuries.


Customs officials at the U.S.-Mexico border are reportedly inspecting beans, searching for any patent-infringing beans being imported into the United States. Because of this bean alone and the threat of infringement, some export sales have dropped over 90 percent also affecting the market for other non-yellow beans. ¹⁹⁵

**Conclusion**

Convention on Biological diversity can be considered as framework of an instrument to protect traditional knowledge at international and national level. CBD has focused on traditional knowledge and it different aspects of conservation and sustainable use of biodiversity and access to and benefit sharing from use of genetic resources. The Biodiversity Act 2002 in India has also taken guidelines from CBD. It is an innovative legislation with adequate measures to safeguard biodiversity and economic interests of local communities. Section 4 and Section 6 of the BD Act 2002 at some extent protect the traditional knowledge from false claims of IPR.

Cases of biopiracy in India present the clear picture how the industrialized countries misappropriated the traditional knowledge of our country to convert it into wealth. These cases demonstrate that the persons or companies who commit biopiracy unless they are caught, enjoys the maximum benefit at the cost of indigenous peoples knowledge. At international level also the cases of biopiracy indicates misappropriation and monopolization of traditional population’s knowledge and biological resources unlawfully. Government and the international community must take bold steps to protect all types of traditional knowledge possessed by the tribal people. Traditional knowledge is not valuable only for those who depend on it but

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also equally important for the growth of modern industries of the country. Especially our's traditional medicinal knowledge needs special attention, otherwise captions containing 'dadi maa ke nuskhe' in the daily magazines will no more be available for us to read