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WHITE BLACK LEGAL is an open access, peer-reviewed and refereed journal provided dedicated to express views on topical legal issues, thereby generating a cross current of ideas on emerging matters. This platform shall also ignite the initiative and desire of young law students to contribute in the field of law. The erudite response of legal luminaries shall be solicited to enable readers to explore challenges that lie before law makers, lawyers and the society at large, in the event of the ever changing social, economic and technological scenario.

With this thought, we hereby present to you

EVALUATION INTERNATIONAL LEGAL FRAMEWORK FOR BIODIVERSITY CONSERVATION

AUTHORED BY - R. NALINI

Introduction:

Conserving biodiversity and safeguarding the ecosystems for the proper functioning of ecosystem services was the objective of recent international initiatives. Such realisation of significance of biodiversity at the international level has started only in the latter half of the twentieth century. Till that period, protecting biodiversity was not a priority for many nations. The biodiversity laws of nations were limited to preventing the pollution or to control over-exploitation of natural resources to protect their terrestrial and marine living resources. Only when transboundary effects of overexploitation of living resources by the neighbouring nations affected the stocks or herds of other countries, these countries entered into bilateral or multilateral treaties to create legal obligations and principles for protection and conservation of living resources on a sustainable basis.¹

The scope of first two initial bilateral treaties, viz., the Convention between France and Great Britain Relating to Fisheries, 1867 and Convention Establishing Regulation Concerning Uniform Fishing between Constance and Basel, 1869 was limited to formulate law relating to conservation of marine biodiversity.² Although before the 20th century few more multilateral or bilateral agreements concerning international environmental issues were made, all these international agreements were based on unrestrained national sovereignty over natural resources and their primary focus was on regulating use of water at the boundaries, navigation, and fishing rights along shared waterways, particularly the Rhine River and other European waterways.³

¹ C. Krieps, "Sustainable use of Endangered Species under CITES: Is it a Sustainable Alternative" 17 University of Pennsylvania Journal of International Economic Law (1996) 461-504.

² Sairam Bhat, Natural Resources Conservation Law (Sage Publications India Pvt. Ltd., New Delhi, 2010) 355; Douglas M. Johnston, The International Law of Fisheries: A Framework for Policy Oriented Inquiries (Yale University Press, 1965) 254.

³ Edith Brown Weiss, "International Environmental Law: Contemporary Issues and the Emergence of a New World Order" 81 The George Town Law Journal (1993) 674.

Only exception to this pattern emerged in 1909 in the bilateral treaty between United States and United Kingdom relating to boundary waters.⁴ Under Article IV of the Treaty, the parties were bound not to pollute the water in such a manner, it will injure the health or property of the other'.⁵

The notable development to prevent pollution, which indirectly aided in preserving the biodiversity had emerged in the international Arbitrations. The Behring Fur Seals Arbitration⁶ and the “Trail Smelter” Arbitration⁷ decisions paved the way for creation of new treaties to protect commercially valuable species. By 1930s to 1940s, some of the States recognized the urgency of conserving natural resources, and hence entered bilateral treaties with the neighbouring countries to protect fauna and flora. These include the London Convention on Preservation of Fauna and Flora in Their Natural State 1933,⁸ and the Washington Convention on Nature Protection and Wild Life Preservation 1940.⁹

After the Second World War, a new phase from the perspective of biodiversity conservation started due to the increasing awareness about the relationship between deterioration of environmental

⁴ Treaty Relating to Boundary Waters Between the United States and Canada, Jan. 11, 1909, U.S.-Gr. Brit., 36 Stat. 2448.

⁵ Ibid, Article IV, 36 Stat. at 2450

⁶ (1898) Moore’s International Arbitration Awards, 755. In this case, the dispute was between US and Great Britain over alleged over- exploitation of fur seals in areas beyond the three nautical miles limit of US territorial waters. The Panel found that the US had no right of ‘protection and property’ in the seals, despite the importance of their conservation for local US citizens and their migration between the high seas and the US territories. However, the outcome of the dispute was a series of provisions, binding on the two parties to regulate seal fishing in the area, displaying many of the features of modern conservation treaties

⁷ 3 UNRIAA, p. 1905, 1952. The dispute arose between the US and Canada over Sulphur emissions from a factory in Canada which damaged crops, trees and pastures in the US State of Washington. The Tail Smelter located in British Columbia since 1906, was owned and operated by a Canadian corporation. In 1906, the Consolidation, Mining and Smelter Co Ltd. of Canada acquired the Smelter plant at Trail. Sulphur dioxide fumes emitted from the plant in large quantities in the territory of Canada spread to the United States of America causing damage there. Pollution is capable of spreading from one continent to another and from one place to the other. Thus, it was alleged that the fumes emitted in large quantities to the air formed acid rain in a later period and through that caused damages up to a distance of seven miles in the territory of the United States. It was observed that under the principle of International Law, as well as of the United States, no State has the right to use or permit the use of its territory in such a manner as to cause injury or fumes in or to the territory of another or the properties of person therein, when the case is of serious consequences and the injury is established by clear and convincing evidence. The Tribunal confirmed the principle that a state is responsible for environmental damage to foreign countries caused by activities within its borders, and awarded compensation to be paid to the United States by the Government of Canada which the Canadian Government agreed. The Arbitration further laid down that, if there is a threat of serious continuing harm, the state must cease the harmful conduct and, in this respect, the Tribunal required the parties to effectuate a monitoring regime to ensure that further damaging pollution did not occur. See, Edith Brown Weiss, “International Environmental Law: Contemporary Issues and the Emergence of a New World Order” 81The George Town Law Journal (1993) 676.

⁸ Convention on the Preservation of Fauna and Flora in Their Natural State, 1933.

⁹ Convention on Nature Protection and Wild Life Preservation in the Western Hemi-sphere, 1940.

quality and economic development and the need to preserve the quality environment. The nations wanted to address the environmental issues like, preventing nuclear damage from civilian use¹⁰ and marine pollution from oil,¹¹ hence, new Conventions were made and fixed international liability for nuclear damage and required measures to prevent oil pollution at the sea. However, the scope of these conventions are limited to prevention of pollution and did not extend to protect biodiversity.

The gradual development of biodiversity conservation initiatives at the international level commenced with the introduction of soft laws and finally reached the stage of covering all aspects of biodiversity. Hence, these legal initiatives pertaining to biodiversity can be broadly classified in to approaches made before the earth summit 1992, which involves creation of international conservation laws, conventions and declarations to protect the environment, etc., and the aftermath developments of earth summit, which discusses the origin of Convention on Biological Diversity, its main features and its effect on India.

Effectiveness of Forest Laws And Policies:

Forests support a rich assemblage of floral and faunal biodiversity and have also been the ancestral habitat of diverse tribal and indigenous communities. From time immemorial, Indian culture supported the idea of biodiversity conservation and created the strategy of worshipping the plants, animals and even the forests. Forests, like other vital resources were managed traditionally as common resources with strict, though informal, social mechanisms to control the exploitation of such resources, to ensure sustained productivity. In addition to the large tracts of natural forests that were maintained through this careful husbanding, village forests and woodlots were also developed and maintained through the deliberate selection of appropriate tree species.¹²

This customary practice of protecting, nurturing and conserving biodiversity had undergone drastic changes during the colonial period due to the sudden change of rules pertaining to forest

¹⁰ Convention on Third Party Liability in the Field of Nuclear Energy, 1960

¹¹ International Convention for the Prevention of Pollution of the Sea by Oil, 1954.

¹² M. Moench and J. Bandyopadhyay, "Local Needs and Forest Resources Management in Himalaya" in J. Bandyopadhyay et al (Eds.) India's Environment: Crises and Responses (Nataraj Publications, Dehradun, 1985) 52-77.

management and utilization introduced by British rulers. Change of attitude towards the biological resources, transformed the conservative attitude of the people into commercialisation of the bio resources. Introduction of legislative measures through Laws and policies by the British rulers, had worsened the situation and uprooted the traditional practices of conservation, thereby causing biodiversity loss at a speedy pace.

The colonial system of forest management introduced in India had two consequences. Firstly, the British rulers introduced zamindari system by changing the land tenure, and transformed common village resources into private property of newly created landlords. The laws introduced during that period did not recognise the customary practices of sacred forests, worships etc., which was the main source of belief for Indians to conserve biodiversity conservation. All these changes in the socio religious ways of life of the commoners hampered their right to use biological resources sustainably to fulfil the requirements of their domestic needs. Only village forests were meant for the use of such people, which was not sufficient for the common public to satisfy their daily requirements.

Secondly, the British rulers considered Indian forests as the source of revenue and their aim was to commercialise the timbers of the forests. As a result, the government itself ordered for large-scale felling of trees to satisfy commercial needs such as ship building for the British Royal Navy and railway sleepers for expanding railway network in India, created an extraordinary force for destruction. After about half a century, such uncontrolled destruction of forests impacted their economic gains, hence they felt the need to control use and utilisation of forest resources.¹³

The legislative initiatives of the British government introduced in 1865, 1878 and 1927, reserved forest areas for commercial utilisation of biological resources by the British rulers or by their authorised persons. It is clear from the provisions of the Forest Act 1927 that, the British Government emphasised and favoured revenue-generating demands, both from forests and agriculture. More importantly, the purpose of the 1927 Act was not simply to consolidate the already established law, but the new legislation was an effort to “codify all the practices of the

¹³ J. Bandyopadhyay et al, *The Doon Valley Ecosystem: A Report on the Natural Resource Utilisation in Doon Valley* (Department of Environment of the Government of India, New Delhi, 1984) 17-18.

forest officials.”¹⁴ The aim of the Forest Act was not to conserve the biodiversity from ecological perspective, and it does not portray forests as a habitat where man dwells and lives in harmony with the forests. The Act does not speak of biodiversity or the relevance of conservation. Even the definitions of ‘forest produce’ and ‘tree’ are economic definitions in the sense that the Act enlists only those forest products and plants which have economic values.¹⁵ The Act never aimed to protect the vegetation cover of India. It was passed only to regulate the cutting of tree to earn and retain the revenue from the forests.

The economic motive behind enacting the law deprived the rights of nomads and the tribal people which was an age old right and a privilege to use the forest and forest produce. It also denied common ownership or occupancy rights of the tribals, and all the forest areas not owned by the people were declared as the property of the Government. To settle the disputes regarding ownership and occupancy right, the forest settlement officer was given full discretion, and the person in-charge had the right to determine the extent of the rights such as, grazing, water resources, cultivation or shifting cultivation and use of forest produce. The Act recognised only two forms of ownership, State ownership of all non-cultivated lands and private ownership of all cultivated lands.

Even after independence till recent days, the same tendency among the government officers continued and in cases of dispute over the rights of local people over a piece of land, the provisions of the Land Acquisition Act 1894 was applicable to assess the ‘public interest’ and to assert the supremacy of the State over the concerns of the locals. Although the legislations like the Panchayats (Extension to the Scheduled Areas) Act (PESA), 1996 which give the protective rights to the local communities to control natural resources, including use of minor forest produces are there, these legislative measures have remained largely unimplemented or have been suppressed by individual states, since land use is a state subject. States, in their attempts to get investments are reluctant to implement the provisions of Panchayats (Extension to the Scheduled Areas) Act,

¹⁴ Benjamin Weil, "Conservation, Exploitation, and Cultural Change in the Indian Forest Service, 1875- 1927" 11 *Environmental History* (April 2006) 319-343.

¹⁵ Arnab Kumar Hazra, *History of Conflict over Forests in India: A Market Based Resolution A Working Paper Series* (Julian L. Simon Centre for Policy Research, April 2002), available at, http://www.libertyindia.org/policy_reports/forest_conflict_2002.pdf, last visited on 01/11/2020.

1996. This reluctance ensures that the collection of minor forest produces and trading them for commercial gains is monopolized by the state forest departments and thereby the local communities right to protect their natural forests have been deprived.¹⁶ In case if the locals have been given the right to use the minor forest produces for their domestic requirements, in order to retain the resources, these communities would actively take part in conserving the biological resources. But the non-involvement of the locals and indigenous community's attitude, adopted from the days of the Forest Act, 1927 reduces all these chances of public participation in conserving the biodiversity.

The Forest Act of 1927 and subsequent administrative developments during the British period, introduced scientific forestry in the government owned properties to grow and export timber to satisfy their revenue requirements. During that time, government owned properties had many evergreen forests and tree species which were not having commercial value. The ecological value of such forests were totally ignored and new plantations were made by replacing these diverse species of plants, to create mono species teakwood forests.¹⁷ Although the government indulged in afforestation activities, these commercial teak wood forests caused loss of many species and habitats.

In addition to that, scientific forestry introduced through formal policies, displaced the forest dwellers, criminalized shifting cultivation, banned grazing of domestic animals and denied the opportunity to hunt and fish in the reserved forests.¹⁸

Hunting and fishing in the reserve forest lands were permitted for the British people, and commercialization activities like, selling the valuable teak and other timber in the reserved forest by the officers was also legalised. Because of uncontrolled killing of wild life and destruction of natural habitat of the species huge loss of biodiversity took place.¹⁹

¹⁶ Armin Rosencranz, "The Forest Rights Act 2006: High Aspirations, Low Realization" 50(4) Journal of Indian Law Institute (2008) 658

¹⁷ Madhav Gadgil, "Conserving Biodiversity as If People Matter: A Case Study from India" 21(3) Economics of Biodiversity Loss (May, 1992) 266-270 available at <http://www.jstor.org/stable/4313937>, last cited on 24/03/2014

¹⁸ M. D. Subhash Chandran, "Shifting Cultivation, Sacred Groves and Conflicts in Colonial Policy in the Western Ghats" in Richard Grove, et al., Nature and the Orient (Oxford University Press, New Delhi, 1998) 712-17.

¹⁹ P. Ishwara Bhat (Ed.) Natural Resources Law, Concepts and Approaches (Eastern Book Company, Lucknow, 2016) 51.

Narrow interpretation of the term “conservation” used in the legislation generated severe conflicts at two levels. At the level of utilization, the new management system catered only to commercial demands and ignored local basic needs. People were denied their traditional rights.⁹ At the conservation level, since the new forest management was only concerned with stable forest revenues and not with the stability of forest ecosystems, ecologically unsound mono-species forestry undermined biological productivity of forest and transformed renewable resources into non-renewable ones.²⁰

The technological advancement and the industrialization of colonial period was another setback for conservation of biodiversity. Ability to process, store and transport through modern means resulted in deep inroads into forests and mineral resources changed the patterns of land use. The earlier way of simple and cordial life with the nature was replaced by profiteering motive and the heightened technological competitiveness-imposed toll on the nature.²¹ But the forest laws of that period did not prevent such activities by the administrators.

After the transfer of forests from the State list to the Concurrent list of the Constitution, the Central government enacted the Forest (Conservation) Act, 1980 to directly manage India’s forests in order to regulate deforestation, control dereservation of reserved forests and prevent unauthorised use of forest land for nonforest purposes. Despite the enactment of Forest Conservation Act, 1980 and subsequent Rules in 2003, there has not been much success in reducing forest diversion and loss of forests. The reasons for this are manifold.

First of all, the Forest Conservation Act, 1980 failed to define the term “forest” properly except to say that it included lands that were notified as forest under the Indian Forest Act, 1927. The question of definition gained prominence in deciding the use of forest land for non-forest uses. In 2007, the Ministry of Environment and Forests (MoEF) reconsidered the definition, and included any area under government control, notified or recorded as “forest” under any Act, for conservation and management of ecological and biological resources. This definition accommodated the earlier legislation and forms of state control over forests. Overall, the definition of forest has been

²⁰ J. Bandyopadhyay, *supra* note 2, 319-343

²¹ C.T.S. Nair, “Crisis in Forest Resource Management” in J. Bandyopadhyay et al (Eds.) *India’s Environment: Crises and Responses* (Nataraj Publications, Dehradun, 1985) 7-25.

amenable to various interpretations depending on the needs of the forest and other administrative officers of the nation.²² Such subjectivity in definition has facilitated easy transition of forest to non-forest boundary and use. The word 'forest' has been used generically for recording even community grazing and other common lands. Ninety per cent of the country's natural grasslands, which harboured rich biodiversity, have been destroyed by being declared as state 'forests'. The main purpose of such declaration by the forest departments is to grow and collect timber by planting exotic tree species in such grasslands.²³ The trees planted destroyed the natural habitats of grassland and killed many species that were dependent on them.

Another major change brought by the Forest (Conservation) Act is shifting the power of conservation from states to the centre. The centralised supervisory powers do not impose the liability on the central government to introduce measures required for rejuvenating the lost forest.²⁴ According to this Act, only a centralised authority is vested with the responsibility of clearance and there is no obligation of the developers or state authorities to protect forests and local livelihood. Although the Act provides for the constitution of Forest Advisory Committee (FAC) in the Ministry of Environment, Forest and Climate Change (MoEF and CC) and Regional Empowered Committees, these institutions were not given the power to advise the states on planning forest conservation strategies. The Forest Divisions of the State Government have to spend their time and capacity to protect the forests, but in the absence of any share in the forest management or a sense of ownership, Forest Divisions will not take the issues of conservation seriously.¹⁵ Shifting of powers to the central government to decide the matters relating to afforestation, clearing forest covers for regrowth of forests and so on has caused denudation of forests or deforestation in many states including Karnataka.²⁵

²² Smriti Das, "The Strange Valuation of Forests in India" 45(9) EPW (2010) 16.

²³ Madhu Sarin, *Laws, Lore And Logjams: Critical Issues in Indian Forest Conservation* (The Gatekeeper Series of the Natural Resources Group, IIED, 2005) 7

²⁴ S. Vijay Kumar and Nidhi Srivastava, *Restructuring the Environmental Governance Architecture for India*, a Discussion Paper of The Energy and Resources Institute (October, 2017), available at, <https://www.teriin.org/policybrief/files/environmental-governance/mobile/index.html#p=1>, last visited on 04/11/2020.

²⁵ N.C. Saxena, *Forests, People and Profit, New Equations for Sustainability* (Centre for Sustainable Development, Lal Bahadur Shastri National Academy of Administration, Mussoorie, 1995) 1-37.

Socio-economic Implications of the Biodiversity Law:

The provision made under the Biological Diversity Act to permit the applicants to obtain IPRs over the inventions based on biological resources has a broad objective of sustainable development of the country. However, the extension of IPR to the biological resource based inventions has direct impact on the sustainability of the biodiversity. The economic development dimension added in the Act and the provisions connected to it permits commercial exploitation of biological resources and associated traditional knowledge. Such economic concern has direct implications on various aspects of the life of the people. Some of these consequences are as follows:

Agriculture:

Agro -biodiversity is the most essential requirement to ensure proper agriculture related activities of the world. It contributes directly to the livelihood of a large segment of mankind and is the basis for all human food consumption. Agrobiodiversity is the contribution of the farmers, who have selected the wild varieties of crops, refined them into domesticated farmers varieties to produce the agricultural products. Similarly, they have developed domestic animals breeds which are suitable to the local environment. Agro-biodiversity is one major component of the biological diversity of the country and hence, the issues concerning conservation and management of agrobiodiversity have to be given high priorities. Loss of biodiversity has direct impact on the agricultural production because diversified varieties of plants and animals help to increase the production quality and quantity of the agricultural production. The modern plant biotechnology activities are also dependent on the agrobiodiversity and the wide range of genetic materials produced by it.

Some of the provisions of the Biological Diversity Act, 2002, especially provision for IPR protection on biological resource based inventions and revealing the traditional knowledge under benefit sharing mechanisms indirectly threaten the sustenance of the biodiversity, including agrobiodiversity. The impact of IPR protection to the biological resources and genetic material based inventions on the agro -biodiversity are as follows:

IPRs and Monocultures:

One of the major criticisms made against new plant variety protection under the IPR regime is that it favours centralised crop breeding and creates uniform environmental conditions by discarding local breeding tailored to local conditions. Use of genetic resources for food and agriculture to create genetically modified plant varieties with desired traits will enhance the productivity in the agricultural sector. However, the seed companies tend to focus their research on commonly utilised highvalue crops and develop varieties that can be cultivated as widely as possible. To do so, they select the genes of maximum adaptability and introduce new seeds which avails IPR protection and maximum economic benefits to them. Although such seeds and plant varieties are beneficial from the economic point of view, these genetically modified plant varieties have direct impact of reducing the heterogeneity of the species. The policy initiatives to protect new plant varieties encourage the breeders to invent more number of seeds and other propagating materials by altering the natural gene sequence to boost immunity or resistance to the pests or diseases. Due to the availability of such pest resistant and disease resistant seeds, farmers will shift to cultivate the genetically modified crops by discarding varieties of seeds on the same crop, which they were using earlier, which has biodiversity-erosive effects and leads to decreased crop diversity, decreased spatial genetic diversity, increased temporal genetic diversity and increased use of external inputs.²⁶

In addition to moral conundrum of altering the natural state of organisms, these genetically modified varieties (GM varieties) pose various health hazards and environmental risks. There is a high possibility of gene flow among the other related species and their wild relatives, which may lead to the transfer of the trans-genes from the GM crops to their wild counterparts. An irreversible or uncontrollable escape of genes from a GM crop to neighbouring plants of the same species, wild or domestic, may take place through the process of natural cross pollination or pollen transfer, and result in evolution of new wild species. Such varieties may cause threat to the survival of existing species, thereby causing imbalance in the eco systems and extinction of valuable genes, which is the product of millions of years of evolution. The ecosystems have their own natural mechanism of balancing the population of various species, which is essential for maintaining the biodiversity;

²⁶ R.T. Gahukar, "Status of Genetically Modified Food Crops in India" 31(1) Outlook on Agriculture (2002) 43–49.

will get disturbed with the intrusion of such transgenic plants.

Further, genetically modified organisms (GMOs) are threatening the conventional practice of seed saving. Indian agriculture tradition among the farming communities makes the farmers to store the seeds for reusing, and sharing and exchanging the seeds with the neighbours and in very few cases, selling of farm-saved seeds for financial considerations. These indigenous seeds conserved for centuries by farmers will have the ability to adapt to the local conditions.

But, the genetically modified crops act as a threat to these traditional seeds. It is estimated that GM pollen can travel hundreds of meters downwind under normal weather conditions and in exceptional conditions, much longer dispersion of tens to hundreds of kilometres may occur. Cross pollination of these trans-genes with the farmer bred varieties will result in undesired varieties and contaminated seeds. The farmer will not be in a position to protect his seeds from such foreign gene attack or it is not possible for him to grow his traditional crops thereafter. The farmers will lose different varieties of seeds they have preserved for decades due to contamination of the seeds. The final outcome of the GM crops is monoculture crop production and the seed sovereignty of the multinational seed industries. Over the period, it may lead to agricultural slavery, where farmers have to purchase the seeds, fertilizers and pesticides from the multinational companies for the price fixed by them.

Monoculture agricultural systems are not inherently biodiversity-erosive, but there is a high chance of replacement of more biologically-diverse ecosystems by such high yielding crops and may cause biodiversity loss. If a monoculture system produces higher yields per harvest or per year compared to a more poly-cultural agro-ecosystem, naturally farmers opt for the monoculture crops to earn more income by replacing the poly-culture. Hence, IPRs alone are not responsible for the loss of agro-biodiversity, but they are bound to encourage the displacement of a wide diversity of traditional local varieties. A small number of widely adapted hybrids and homogeneous modern varieties may threaten the gene and species agro-diversity of India.²⁷

²⁷ Mamta Singh et al, "Biosafety Concerns and Regulatory Framework for Transgenics" 2(3) Res. J. Agriculture and Forestry Sci. (March 2014)pp. 7-13, available at, www.isca.in, www.isca.me, last visited on 02/04/2021.

Another consequence of the use of agro-chemicals on the crop is that, removal of weed by using such strong chemicals will reduce food supply to the insects and birds thereby disrupt the food chain of the nature. It causes destabilization of the ecosystems resulting in the loss of genetic diversity. Although recognising IPR over the plant related inventions is not directly responsible for these consequences, in the absence of strict vigilance over environmental friendly chemicals to protect the genetically modified crops and biotechnology inventions made by the breeders, invaluable biodiversity of the country may be lost.

Although the Convention on Biological Diversity gives directions to prevent any environmentally harmful biotechnology activities, and similar duties have been imposed on the central government by the Biological Diversity Act of India, there is no clarity as to who is having the ultimate power to supervise and regulate such activities. In India to regulate application of biotechnology inventions in agriculture there are three different Ministries or the Departments; namely, Ministry of Agriculture, Ministry of Environment and Forests and Department of Biotechnology, working under Ministry of Science and Technology. The legislative framework on agro-biotechnology rests mainly with the Ministry of Environment and Forests, and it regulates the production, importation, sale and use of genetically modified organisms(GMOs) in accordance with the Rules for the Manufacture, Use, Import, Export, and Shortage of Hazardous Microorganisms, Genetically Engineered Organisms or Cells, 1989. But this power of MoEF is not extended to use of GMOs in the food stuffs or other edible things. Such issues are checked and certified by the FSSAI which is working under the Ministry of Health and Family Welfare. There are different bodies mentioned under the Rules, 1989 and FSSAI to check the standards of GMOs. Besides these, there are separate bodies created under PPVFR Act, Patent Act to decide whether the GMOs produced fulfilled the criteria required to give intellectual property protection. Though the common intention of these authorities is to protect public interest, lack of coordination among the departments or these bodies may cause disastrous effect on the agrobiodiversity.

Food Security:

One of the biggest issues raised on intellectual property rights over the inventions on plants is particularly in the context of their impact on developing countries food security. Food security at individual level implies that people must either have a sufficient income to purchase food or the

capacity to feed themselves directly by growing their own food. But from the wider perspective, food security is not mere production of an adequate amount of food or availability of food stuff in the market, but it requires to ensure the citizens of the country that, they can afford to buy enough food to satisfy their basic nutritional requirements. Hence, food security is dependent on effective access and appropriate distribution of existing foodstuffs.

Food security is also influenced by policies concerning the management of agricultural biodiversity. One of the major debates with regard to food security is the contribution of agro-biotechnology in meeting the food needs of the world's population. India witnessed green revolution in 1970s with the introduction of highyielding wheat and rice varieties. But these crop varieties required heavy applications of agrochemicals and were blamed for making the agricultural lands infertile. India witnessed the impact of infertility of the soil after the Green Revolution, and impact of transgenic plant varieties on agricultural management are partly similar that. While the large seed companies who are leading the agro biotechnology research need not be cautious about the interest of the farmers and ecology. Even the WTO Ministerial Conference at Doha, emphasised that special and differential treatment is necessary to allow developing countries to take into account their development needs, by considering the food security of such countries, the mandatory requirement mentioned under Agreement on Agriculture of WTO may threaten the food security of the nation.²⁸

Though IPRs have the potential to enhance agricultural production, introduction of IPRs in agriculture has direct links with other forms of property rights, such as rights over biological resources. At the national level, the role of farmers in conserving and enhancing agro-biodiversity has generally been recognised but this is not necessarily recognised as a specific claim over resources or knowledge. Hence, allowing to obtain IPR in agriculture curtails farmers' control over their resources and knowledge. The introduction of genetic use restriction technologies (GURT) would constitute a specific challenge in this context since this would provide a tool for patent

²⁸ WTO, Ministerial Declaration, Ministerial Conference – Fourth Session, WTO Doc. WT/MIN(01)/DEC/1 (2001), available at, https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S009-DP.aspx?language=E&CatalogueIdList=37246&CurrentCatalogueIdIndex=0&FullText Search=, last visited on 14/05/2022.

holders to ensure that farmers fully respect patent rights.²⁹

Introduction of IPRs in agriculture must also be examined in its broader context of biosafety. The international initiatives have clauses to prevent awarding of grant of IPRs to the inventions which are likely to threaten the biosafety. For instance, the TRIPs Agreement recognises potential environmental harm as valid reason for not awarding patents to the invention. The Convention on Biodiversity requires the member states to ensure the conservation and sustainable use objectives before allowing to obtain intellectual property rights on biological resources. The Cartagena Protocol on Biosafety recognizes the consequences of transboundary movement of genetically modified organisms (GMOs) on biodiversity conservation and its sustainable use.

The Biological Diversity Act of India specifically mentions that the Central Government should initiate measures to regulate, manage or control the risks resulting from biotechnology. It may be in the form of use and release of living modified organisms (LMOs) to the environment which would likely to have effect conservation of biodiversity and sustainable use of biological resources and human health.

In practice, there are other challenges posed by the biotechnology industries in India. For instance, Monsanto India Limited was setup in India in the early 1970s, much before the enactment of the Biological Diversity Act, 2002 or the Environmental Protection Act, 1986. The first product marketed by Monsanto in India was the Bt. Cotton seed, which was Bollworm resistant cotton seed in 2002. Monsanto charged around Rs. 900 for 450gms of seed and disallowed farmers to reuse the seeds in the second year of sowing.³⁰ In 2006, just four years after the release of first-generation GM cotton seeds, the pink bollworm became resistant to it and as a result, Monsanto released second generation Bt cotton, and within a few years, that seeds are also succumbed by pink bollworm. In 2015, the Bt cotton crop was attacked by whitefly, which destroyed two-thirds of the crop, causing an estimated loss of Rs 4,200 crore. Under these circumstances Monsanto insisted the farmers to use the insecticide developed by it and as per the report use of quantity of such

²⁹ Derek Byerlee and Ken Fischer, "Accessing Modern Science: Policy and Institutional Options for Agricultural Biotechnology in Developing Countries" 30 *World Development* (2002) 931.

³⁰ The Hindu, dated Dec. 17, 2017, available at, <http://www.thehindu.com/opinion/op-ed/The-battleover-Bt-cotton/article15424211.ece>. Last visited on 10/04/2019

insecticides are increasing every year. As per the reports, the use of insecticide per hectare was 0.5 kg in 2006 and it has been increased up to 1.20 kg per hectare in 2015.³¹

The possibility of genetic contamination by the genetically altered living organisms (LMOs), including the plant varieties into the open environment is one more threat posed by the biotechnology industries of India. Although the Biological Diversity Act addresses the issue by empowering the central government to examine the effects of LMOs on the environment, it is difficult to assess the adverse impact of such GM products, since the effects are gradual and can be discovered after a long term observation. The modified living organisms may crossbreed, or cross pollinate with indigenous species. These hybrid varieties will be the dominant species, which will destroy the local traditional varieties and disturb the ecosystem.

There is a high possibility of disturbing other species, and causing damage to butterflies, soil and other types of flora and fauna by GM crops.³² The use of GM seeds may not only create “superweeds” but also “superbugs” that, over time, become resistant to GM crops and to other herbicides and pesticides. Indian experience of Bt Cotton in 2015 at Punjab’s Malwa region is a good example for the disguised threats of IPR on plant varieties. As mentioned earlier, huge swarm of whiteflies, one of the less virulent pests of the cotton crop have ravaged the cotton crop and destroyed almost two-thirds of the state’s cotton crop.³³

Incidents like the failure of crops either because of resistance developed by the pests, insecticides and weeds, or due to the cross pollination effect on the traditional crops, have direct impact on the food security of the nation. Besides that, illegal use of terminator technology by the seed companies and exorbitant prices for the seeds will affect the large scale farmers of the country and disturbs the food security assured by the country to its citizens.

³¹ Sarah Compson, Failed promises the rise and fall of GM cotton in India (Soil Association, October 2017) available at, <https://www.soilassociation.org/media/13510/failed-promises-e-version.pdf>, last visited on 14/05/2022.

³² Hilary Weiss, “Genetically Modified Crops: Why Cultivation Matters” 39 *Brook. J. Int'l L.* (2014) pp. 875-896, available at: <http://brooklynworks.brooklaw.edu/bjil/vol39/iss2/8>, last visited on 10/04/2021

³³ <https://www.livemint.com/Opinion/7EGr4LSba8Jk9ox6u623DN/Why-farmer-suicides-in-punjab-isa-climate-story.html>, last visited on 10/04/2021

Impact on Traditional knowledge:

Biodiversity related traditional knowledge has contributed tremendously towards the conservation of biodiversity. Although indigenous communities of India are illiterate, they have tremendous knowledge about the requirement of diversified species, maintenance of ecosystems and need to maintain all forms of life for the human survival. In addition to that, they have developed the techniques of sustainable use of the biodiversity and its components which may be a knowledge of growing and preserving crops and seeds, using the plant and animal extracts as medicines and other uses. However, the recent increased awareness of the commercial values of biodiversity, has posed a threat to the traditional knowledge of these communities and due to illiteracy and ignorance, majority of the people of these communities are in a position to protect their resources and knowledge.

There are two major threats to traditional knowledge. Firstly, biopiracy, which is a common threat to all the developing countries and the scientists and researchers of developed countries use the biological resources and associated knowledge without acknowledging the traditional knowledge used by them. In India, both Indian and foreign biotechnology related corporations both, are using the traditional knowledge of indigenous communities without prior-informed consent of the knowledge holder and without paying share in the benefits received. Under the wide scope of biopiracy, the researchers and scientists may claim IPR protection to the traditional knowledge to gain monopoly over the products prepared by using the biological resources and traditional knowledge.³⁴ In fact, a large number of patents have been granted on biological resources and associated traditional knowledge of India without the consent of possessor of the knowledge. For instance, the incidents of Neem patent, turmeric patent, and Basmati Patent are the three classical cases of biopiracy of Indian traditional knowledge. While Neem patent application was filed before the European Patent Office for a method of controlling fungi on plants by applying Neem oil formulation on fungi, turmeric patent application was made for patent grant before the US Patent office for oral and topical use of turmeric powder for wound healing. From time immemorial, both neem and turmeric are used in Indian household and ancient Indian ayurvedic texts have described medicinal values of both. Hence EPO and USPTO revoked the patent for the reasons lack of

³⁴ Tejaswani Apte, supra note 95, 35

novelty, inventive step and possibly form a relevant prior art.³⁵

One more eye opening incident of biopiracy was the misuse of Indian traditional knowledge and the geographical indication, 'Basmati rice', where the US patent office granted a patent to a rice variety ('American Basmati'), which was similar to Indian Basmati rice, in its appearance and aromatic quality.³⁶ Against the arguments of Ricotech company stating that, the rice variety invented had certain 'novel' Basmati lines and grains which makes it possible to produce high quality, higher yielding Basmati rice worldwide, the Indian Government had filed its opposition against Indian breeds of Basmati and finally USPTO revoked the patents of the rice varieties derived from the basmati grains of Indian origin.³⁷

The second threat arises from modern system of IPRs, which grants monopolistic private rights to the owner of such IPR. Traditional knowledge is community based information which is shared within indigenous communities. The knowledge may be related to the use and sharing of seeds, knowledge about medicinal properties of plants, or techniques of production. Once the IPR protection is granted to the developer of new technology, though based on traditional knowledge, he will own such information exclusively and exploit it by excluding the society at large. Such transformation, from collective rights of the community to individual right affect the rights over traditional knowledge of indigenous or local communities.

Traditional Knowledge, as considered by the Convention on Biological Diversity and the Nagoya Protocol, is an accumulation of living knowledge which gets passed down from one generation to another and forms part of the very identity of communities and cultural groups. Hence, preservation of traditional knowledge is intended to provide self-identification to the indigenous communities and if such knowledge is having a high potential in terms of economic aspects, then the knowledge and the benefit of sharing the knowledge should be used for general wellbeing of the communities.

³⁵ Saipriya Balasubramania, Traditional Knowledge and Patent Issues: An Overview of Turmeric, Basmati, Neem Cases, available at, <http://www.mondaq.com/india/x/586384/Patent/Traditional+Knowledge+And+Patent+Issues+An+Overview+Of+Turmeric+Basmati+Neem+Cases>, last visited on 10/04/2021

³⁶ Utsav Mukherjee, A Study of the Basmati Case (India-US Basmati Rice Dispute): Geographical Indication Perspective, available at, <https://ssrn.com/abstract=1143209>, last visited on 10/04/2021.

³⁷ Saipriya Balasubramania, supra note 104

It is evident in the cases of neem and turmeric patents that only when the country has written or documentary evidences to prove the facts, then only it can protect its traditional knowledge from biopiracy. In a country like India, majority of the traditional knowledge are orally transferred and not preserved in a systematic and organized documentation form by the communities, hence in case of biopiracy the communities may not be able to protect their rights. Besides this, if the information is documented ordinarily it is recorded in the local language of the communities which the foreign patent offices find difficult to translate and understand. Although the Biological Diversity Act has provisions to prepare Peoples' Biodiversity Registers, the documentation of the traditional knowledge is not legally protected.

Hence such biopiracies will have both economic as well as ethical implications on the traditional knowledge holders. The benefit sharing claim arises only when the knowledge holder has documented such knowledge. On the other hand, if the bio pirate is successful in obtaining IPR then the original traditional knowledge holder will be prohibited from making commercial use of such IPR protected knowledge or to sell an indigenous product that is covered by an IPR. Hence there is a high chance that the IPR protection to biological resources and associated traditional knowledge give rise to reverse transfer of technology.

Impact on Human Rights:

The relationship between IPRs and Human Rights has been a subject of intense discussion during the last two decades more specifically after the adoption of the TRIPs Agreement. Special attentions given under TRIPs agreement to do researches on the biological resources and obtain IPRs over such biotechnology inventions gets further boost in terms of investment and development, which will lead to greater food production, and greater food security along with development of new plant varieties which will further the realization of basic human rights.

However, the framework for intellectual property protection primarily concerned with providing economic incentives for one's intellectual creativity rather than specifically concerned with the realization of individual or collective human rights.³⁸ Nature and purpose of human rights and

³⁸ Philippe Cullet, Intellectual Property Protection and Sustainable Development (LexisNexis, New Delhi, 2005) 386.

IPRs are different as it has been rightly stated, human rights are fundamental as they are inherent to the human being, whereas intellectual property rights are the means through which States seek to provide incentives for inventiveness and creativity, and encourage the dissemination of such information for the benefit of the society as a whole. The debate on co-existence of intellectual property and human rights therefore has generated two opposing camps. The conflicting approach considers intellectual property protection over the biological resources and associated knowledge as undermining the broad spectrum of human rights obligations and incompatible with the objectives of human rights jurisprudence.

On the other hand, compatible approach views human rights and intellectual property rights as essentially compatible, though there is an disagreement in striking a balance between granting incentives to the inventor and the right of access to the possible user of such invention.³⁹

The implementation of strong IPR regime including patent and plant variety protection as envisaged in the TRIPs Agreement have the potential to impact the realization of human rights in developing countries. Prior to the Biological Diversity Act, 2002 there was no legal right recognised over the traditional knowledge in India. By treating traditional knowledge as effectively un-owned, intellectual property law allowed the outsiders to use such knowledge for unrestricted exploitation for financial and technological benefit without giving any benefit to the holder of that knowledge.

Because ownership and property rights under modern legal systems are foreign to most traditional knowledge based communities, many concluded that traditional knowledge is the property of nobody, until it is discovered by explorers, corporate scientists, governments and so on. Thereby the IPRs over traditional knowledge were justified. But this approach effects the human rights of the indigenous communities, whose centuries old knowledge and community owned resources are getting exploited, without proper acknowledgement or a fair share in the commercial benefits.⁴⁰

Although, the Biological Diversity Act provides for access to benefit sharing, it may not be the

³⁹ L.R Helfer, "Human Rights and Intellectual Property: Conflict or Coexistence?" 5(I) Minn. Intell. Prop. Rev. (2003) 48-49.

⁴⁰ Sunita K. Sreedharan, "Bridging Time and Tide- Traditional Knowledge in the 21st Century" 15 JIPR (March, 2010) 149.

practical reality. The giant corporations, who have invested in research and IPR are not always willing to share profits in an equitable manner with local community and as discussed earlier right to protect and claim arises only when the knowledge is documented. Even where laws and policies support benefit sharing, it is easy to ignore village or forest communities due to their illiteracy, poverty and ignorance of their rights. Even in cases where mutually agreeable benefit-sharing is negotiated with a local community, negotiating capacities of such communities are generally weaker than that of corporations. Therefore, the arrangements entered into, even willingly by communities may not necessarily favour them. It is most common that, unfair and unequal benefit sharing arrangements, whereby communities may lose access to, or control over their natural resources. Kani tribe's arogyapachcha incident is the best illustration in this regard. Further, the corporations may often focus on sharing benefits with the government or government bodies or local research institutes rather than with local communities. Such benefit sharing agreements may give financial and other benefits to the nation, but violate the basic human rights of the indigenous and local communities who have preserved and nurtured biodiversity and associated knowledge.

Conclusion:

To conclude, the biodiversity regime of India has failed to fulfil the requirement of protecting biodiversity. Before 2002 there was no specific law to address biodiversity as a matter of concern and during that period, conservation and protection of biodiversity was highly dependent on the environmental laws such as Forest legislation, wildlife protection law, environment protection law and so on. By the time, Biological Diversity Act was enacted; India had adopted the IPR norms stipulated under the TRIPs Agreement. To coordinate with the IPR regime and for sustainable development of the country, Biological Diversity Act focuses more on IPR related issues connected to India's biological resources and related traditional knowledge. Instead of balancing two contradictory interests, the provisions of this Act create more confusing and contrasting situation for biodiversity conservation. Hence, there are many challenges ahead for safeguarding biodiversity from misappropriation and other issues.