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Biopiracy: The eclipse of indigenous knowledge in India

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Abstract
The concept of Traditional Knowledge is one of the most respectable area which has been continued since generations mainly for the benefit of human race which is carried on by Indigenous people of the society. These knowledges includes various natural resources includes its usage for the medical research purposes. India is the base of such resources considering it a birth place of Ayurveda. The dilemma surfaces when such traditional knowledge unethically procured by outside players and applied for their own selfish advantages, patented without even acknowledging them as a true source. Such misappropriation of genetic and natural resources which is traditional knowledge is known as Biopiracy.
This paper mainly aims to focus into the concept of Biopiracy in India. It critically analyses the areas revolves around the topic including International conventions, national laws and case laws provided in order to curb this menace. Along with conclusion, this paper provides a suitable way forward to control this problem of biopiracy.

Keywords: Biopiracy, Indigenous, Traditional, generations

Introduction
The concept of Traditional Knowledge possesses anecdote spot in Indian society and considered as one of the most valued concept that has been carried on from generations for the benefit of world by the indigenous people. Such indigenous knowledge includes various ideas relating to public's basic resources such as food and traditional medicinal formulation techniques for the sustainable habitat. In India, the ancient medicinal formulation techniques and usage are one of the most famous elements of traditional knowledge still prevalent from long time in various least developed and small regions to whom such modern treatments and facilities are not easily accessible or available nearby to their locality. India is considered as the hub of such traditional medicinal formulation techniques as it is very well-known in the world as a birthplace of Ayurveda as an ancient medication method.
The problem arises when such techniques of indigenous people through the unethical means procured by the third parties or outside agencies in order to commercialize and utilize such techniques for their own profits. Moreover, these third parties or agencies many times get patented such traditional concepts or techniques without giving any due credit to the indigenous people and to the areas which led to the development of such technique or practices. Such process of misappropriation of this traditional technique which involves cultural and traditional knowledge is commonly known as Biopiracy.
This seminar paper targets to delve into the concepts and ideas of such process in order to analyze the practices relating to biopiracy in India. It critically examines and analyze various case studies of biopiracy and the comparative study of various international conventions and national laws which all are formulated to control such practices. In the end, this seminar paper will try to provide the suggestive measures in the form of way forward in order to control such obstacles relating to the biopiracy prevalent in India at present and for future.

Meaning and Scope of Traditional Knowledge
UNESCO defines Traditional Knowledge as the *"the cumulative and dynamic body of knowledge, knowhow and representations possessed by peoples with long histories of interaction with their natural milieu. It is intimately tied to language, social relations, spirituality and worldview, and is generally held collectively*" [1].
World Intellectual Property Organization (WIPO) defines Traditional Knowledge as *"it is knowledge, know-how, skills and practices that are developed, sustained and passed on from generation to generation within a community, often forming part of its cultural or spiritual identity*" [2].
By applying the methods and techniques from traditional knowledge, many families of indigenous communities been able to use them as mode of survival and the sustainable living.
This traditional knowledge may pertain to any food crops, biologically important and life-saving medicinal plants and herbs etc. However, such knowledge and findings pertaining to these resources from various problems, one of the common amongst them may be what called as biopiracy.

Biopiracy: The Tool of Misappropriation
Biopiracy is an unauthorized access of traditional knowledge relating to the biological resources for the profit motives. It is well explained through the explanation "*the misappropriation and commercialization of genetic resources and traditional knowledge of rural and indigenous people*" [3]. In Kiss Catalog V. Passport

[1] Pharmaceutical biopiracy and protection of traditional knowledge, https://www.cabdirect.org/cabdirect/abstract/20143089382 (last visited Jan 2, 2020).
[2] Traditional Knowledge, https://www.wipo.int/tk/en/tk/index.html (last visited Dec 10, 2019).
[3] Understanding, resisting, and acting against biopiracy, FRANCE LIBERTÉS - FONDATION DANIELLE MITTERRAND, https://www.france-libertes.org/en/publication/understanding-resisting-and-acting-against-biopiracy (last visited Dec 10, 2019).

International, the action of piracy was defined as "*any unauthorized duplication of any matter protected by Intellectual Property"* [4]. A person indulged in the act of piracy takes undue advantage of any other's work without taking the prior permission or approval from the original creator or first user of the work. So, it is apparent that biopiracy is the appropriation of knowledge of others for the use of techniques relating to the biological resources.

The major problem with this grim process is gross violation of the integral rights of communities of the indigenous people. Since the indigenous communities does not get the fair chance of applying their work for patent relating to their inventions from the biological resources, whereas, many times giant corporations take the advantage by utilizing such knowledge relating to techniques. Many of them misappropriate it by patenting them in their own name. The patent may have granted even from minor modification in the traditional knowledge slipped from the classification of patent by fulfilling the other requisites for the grant. Moreover, by paying less or in many cases by not paying at all to the indigenous communities for the knowledge used for their own benefits. In several cases, these big corporations provide employments or hire the indigenous people to make them part of their team and this indigenous people have to take this job due to low level income background. They get so indulged with their work which does not give them opportunity to learn about their own product to develop it subsequently. They are not provided any information relating to research and development department which carry out advanced research over such knowledge of the indigenous people [5].

Another problem is the negotiations relating to the profit sharing which can result in the fight within the people of indigenous communities. Most of the times, biological resources are equitably distributed within the entire nation or within a particular region and are access of these local communities. So, if the various communities are commonly using a particular form of plants, it may create uneven clashes between these indigenous communities for the profit sharing benefits as various indigenous communities may claims that they hold command on such traditional knowledge associated with the novel product. This conflict between different indigenous communities most of the times results in court litigations as such big corporations apart from employment offers also provide some meagre amount. Once patented, the partial or complete use of such knowledge ultimately becomes limited only to the big corporations, thus, it results in snatching the indigenous communities of their labour and living by applying biological resources according to the traditional knowledge of such communities.

The major population of these indigenous communities reside in developing or least-developed countries, the major portion of economy of such countries depends upon their cultural and traditional knowledge, such misappropriation leads to inferior position due to less annotation of due credit and revenue. At international level, the act of biopiracy also get intrudes with the sovereignty of the nations since many times, their resources and knowledge get acquired without their knowledge. Thus, the act of biopiracy violates sovereign rights of the states as well as the common heritage of such countries.

Unlike various countries and declarations and readings of various conventions, the act of biopiracy is still not considered as crime in India. As mentioned under Article 1(1) of the International Undertaking on Plant Genetics Resources for food and agriculture (1983) which states about the undertaking is based on the grounds that the "*plant genetic resources are common heritage of mankind and consequently should be available without restriction*" [6]. This suggests that no individual or corporation can claim their sovereignty over such natural resources or restrict its use to others. But, the field of biotechnology especially the patent regime related to biotechnology works against such principles.

As per the above-mentioned contentions, now the main burden is on the developed countries, which all are incidentally also the home of many biotechnologies patent owning big corporations, to draft appropriate regulations in order to provide harmonious norms, so the rights of such indigenous communities is not to be compromised.

Comparative Case Analysis of Biopiracy

One of the first country comes into the mind while discussing about the traditional knowledge is India, especially in the field of medicines through Ayurveda, as it is well-recognized worldwide. Initially developed by Charak in the Indian treatise 'Charaka Samahita' [7], Ayurveda is one of the oldest known traditional healthcare practices in the world. Since ancient times, India is seen as a hotspot of various traditional knowledge as many indigenous communities and tribal population resides in forest areas and possesses distinct understanding and knowledge of the atmosphere they belong to. They lead to play very crucial role for developing the values derived from the environment.

In the medication field, techniques to cure various diseases by using various codified traditional knowledge has been exploited by the giant pharmaceutical companies who obtains important intel for the genesis of biologically active molecules with the support of technology rich countries. Since the codification of various traditional knowledge scripts are developed in regional languages, so the information about their presence is not so easily accessible to the International Patent Offices. Some of the famous examples of acts of biopiracy of Indian traditional knowledge includes-

1. Use of Neem

The traditional Indian tree of neem is very well-known for its integral medicinal values for various purposes. The components of neem have been used as bio-pesticides from immemorial centuries in India. There are various ancient Indian texts of Ayurveda, since the period of 5000 BC had recognized the importance of neem tree and its medicinal values.

[4] Kiss Catalog, Ltd. v. Passport International Productions, Inc, 405 F. Supp. 2d 1169 | Casetext, https://casetext.com/case/kiss-catalog-v-passport-intern-productions (last visited Dec 10, 2019).

[5] Basil B Mathew, *TRADITIONAL KNOWLEDGE MISAPPROPRIATION AND BIOPIRACY IN INDIA: A STUDY ON THE LEGAL MEASURES TO PROTECT TRADITIONAL KNOWLEDGE*, MANAGEMENT RESEARCH 9.

[6] Gregory Rose, *The International Undertaking on Plant Genetic Resources for Food And Agriculture: Will the Paper be Worth the Trees?*, FACULTY OF LAW - PAPERS (2004).

[7] Charaka-samhita | Indian medical text | Britannica, https://www.britannica.com/topic/Charaka-samhita (last visited Dec 11, 2019).

In spite of such huge popularity of the traditional tree of neem in Indian domain, the Department of Agriculture in the year 1994 granted patent to W. R. Grace, a United States based company, for the purpose of fungicide which is prepared through the extraction of oil from neem, although, this patent was opposed by various Non-Governmental Organizations (NGOs) and various other environmental organizations [8].

The contention raised by various organizations and groups were based on claims that this practice is the act of biopiracy, as there is no 'novelty' in the process as well as in product and the idea is clearly stolen by such giant multinational companies from the indigenous communities and the ancient texts. After the submissions of appropriate evidences against the company for wrongful appropriation, the European Patent Office withdrew the granted Patent in May, 2000 after affirming that "there is no invention" and indigenous people of various communities are using the components of neem since many decades. They have also stated that the use of neem is widespread in India and there was a prior use.

2. Use of Turmeric

In the year 1993, the U. S. Patent office and Trademark Organization (U.S. PTO) granted the patent to the Medical Centre of University of Mississippi over the processing use of turmeric as a healing of wounds. This university got the grant of patent after treating through administering of turmeric (curcuma longa) to a patient who was inflicted with a wound, after the appropriate application, the wound healed. Although, Indian communities already possess knowledge and awareness of turmeric's medical wonders. The dilemma arises when India came to know about the grant of Patent relating to the healing components of turmeric to the medical centre of University of Mississippi and they are using turmeric to cure or heal the wounds of the patients, India filed the opposition against the University of Mississippi claiming that the Indian have been aware due to their traditional practices that turmeric can also be used to cure the wounds and contended that the University of Mississippi wrongly appropriated the concept of the healing values of turmeric and the claims submitted by the university is frivolous and should not be maintainable for the grant of Patent due to such wrongful appropriation.

After the submission of all the appropriate evidences as per the contentions and submissions made by India by relying upon the traditional ancient texts which inferred the medicinal qualities of the used term 'haldi' which is Turmeric. The U. S. Patent Office cancelled the granted patent in the year 1998. This case was just another instance where the Indian contingents and other Indigenous communities' groups exposed this very fact that how easily such giant multinational companies finds loopholes in the patent regimes of developed countries and get falsely patented the techniques of century old traditional knowledge [9].

3. The Basmati Rice Case

In the year 1997, the U.S. Patent office granted the patent to RiceTec. Inc., a giant multinational company of Texas which called the aromatic rice generally grown in India and Pakistan as 'Basmati'. After the successful grant of patent in United States, RiceTec. Inc., started dealing in the said 'Basmati' rice in United States as well as exporting it to all the other countries like India on the higher prices.

Such incident ultimately resulted in the huge losses especially to the South Asian countries like India and Pakistan, as such grant of Patent not only hampered India the U.S. market but also the other International market in Asia, Europe and other areas. So, India, being aggrieved by the patent which being granted to the RiceTec. Inc., the US company, took the matter before the World Trade Organization (WTO) for the prima facie violation of the regulations of TRIPS Agreements as according to the regulations of TRIPS, "the products of geographical indication cannot be patented" [10]. Finally, the granted patent on 'Basmati' rejected by the U.S Patent office against the RiceTec. Inc.

4. The use of Jamun, Brinjal and bitter gourd mixture

The renowned United States Company, Cromak Research Inc., was granted patent on the compositions of edible herbal which was prepared by combining the mixtures of Jamun, Brinjal and bitter gourd. The composition of such mixture of all the three components helped in developing the product which resulted to helping in decreasing sugar level. Although, this all are vegetables and fruits which are traditionally found in India and the practice of compromising the mixture were widely followed by the people of Indigenous communities and various groups to control sugar level and to cure various diseases. Thus, India filed an objection against the grant of such patent in the name of Cromak Research Inc. finally the objection application was accepted by the office and they rejected the patent accordingly, as the composition of the mixture which was formed with the combination of Brinjal, jamun and bitter gourd which was already known to the people of indigenous communities from the time immemorial [11].

5. Intellectual Property Rights on Yoga

This is the recent case which is based on the grant of copyright on Yoga which may also come under the purview of the act of Biopiracy. The case of Bikram Chaudhary, who is U.S. based Non-resident Indian. He claimed the copyright on his method of teaching yoga. But he hasn't stopped and he also filed an application for the grant of patent over yoga as well. According to various Yoga teachers, groups, classes and organizations such move was grim in nature because yoga is an art which is known to Indians since ancient times and such open source practice is for the benefit of entire human race and accordingly fall with the public domain and should be remained open sourced.

After the hue-cry on this topic, it came to the notice that United States Patent and Trademark Office (USPTO) has granted around 150 copyrights related to yoga and around 134 Trademarks on yoga and to the shock around 2,315

[8] The neem tree - a case history of biopiracy, https://twn.my/title/pir-ch.htm (last visited Dec 11, 2019).

[9] Patent Act:Biopiracy Of Traditional Indian Products - An Overview,, https://www.countercurrents.org/bhargava140709.htm (last visited Dec 11, 2019).

[10] WTO | intellectual property - Article 22 of TRIPS Agreement, https://www.wto.org/english/tratop_e/trips_e/intel2_e.htm (last visited Dec 11, 2019).

[11] Malipeddi Bhaskar Rao & Manjula V. Guru, *Understanding Trips: Managing Knowledge in Developing Countries* (2003).

patents were assigned on yoga [12]. This step by USPTO was widely criticized and was heavily opposed by India. India has finally decided to oppose such grant of patents, copyrights and trademarks and filed opposition for the IP rights revocation. Although, the verdict is yet to be pronounced.

6. Case of 'Nap Hal' Wheat

This is the famous case where India raised concern for one of the well-known varieties of Indian wheat also famous as "Nap Hal" Wheat. The patent on this was granted under the category of 'plant' to MONSANTO, an American Multinational Corporation. The grant of such patent was challenged by the Research Foundation for Science and Technology coupled with Greenpeace and Bharat Krishak Samaj. They jointly filed a petition on January 27th, 2004 against Monsanto corporation over the grant of patent. After collecting all the appropriate evidence in the case, it came forward that the people of Indian societies especially indigenous communities already possess traditional knowledge on this type of wheat and they have been using it from many centuries. Thus, due to the presence of prior use, this work lacks 'novelty' or 'invention', finally, the granted patent was consequently get revoked on the October, 2004 [13].

7. The Colgate Case

Colgate, a very well-known American Company was accused for stealing for their toothpaste India's almost 1000-year-old tooth cleaning traditional knowledge of recipe. U.S Patent office granted patent to Colgate for the composition of tooth-powder which comprised of rust like red iron oxide, camphor, spearmint, black pepper and clove oil. After the successful grant of patent to Colgate over such product, many Indian activists and organizations accused Colgate for the act of 'biopiracy' claiming it as a theft of almost 1000-year-old recipe for tooth cleaning. Finally, India proved its claims by submitting the evidence of existence of such recipe which resulted in successful opposition on the patent claims of Colgate [14].

8. Aswagandha Case

The case of Reliv International Inc., where this giant company applied for the grant of a patent called 'Aswagandha' which acts as a supplement for the joint problems. In India, the term 'Aswagandha' is not some ordinary word, it is a super plant which had been used for the treatments of various illnesses and diseases which includes depression, insomnia, diabetes, gastritis and convulsion but U.S. Patent and Trademark office granted various number of patents to Reliv International Inc.

When Indian government came to know about such information, they opposed it by relying on the various ancient texts and scripts where it was provided that 'Aswagandha' was already traditionally known to the people of various Indigenous communities and groups and that Aswagandha can be used as a supplement for healthy and fit joints. Although, this case is still going on and judgment upon such matter is yet to be decided [15].

9. Another controversy of Rice

Chhattisgarh, the home of almost 22,792 varieties of Paddy, is also known as the Rice Bowl of India came across one incident relating to the grant of patent on rice overseas. Syngenta, another US based company which mainly works in the area of biotech, also tried to unethically appropriate and steal such precious collection of such 22,792 varieties of Paddy. For this purpose, Syngenta also signed a formal memorandum of understanding (MoU) with the Indira Gandhi Agriculture University (IGAU). The main intention behind signing such MoU was to get the connection of Dr. Richharia., the Ex-director of the Central Rice Research Institute (CRRI), the institute is situated in Cuttack and he is also known as Rice sage of India who is very famous for extraordinary and instrumental works in the field of agricultural research especially Rice. The target of U.S. based company was to get access to the diverse field of the precious collection of rice by building strong connections with the head Dr. Richharia.

After being successful in getting access to the farms of such varieties of rice, the company by misappropriating them, got successful grant of patents on 22,792 varieties of rice but finally India filed objection against such grant of patent which resulted in rejection of patent [16].

Critical Analysis of Biopiracy

After observing all the above-mentioned unfortunate instances, it becomes apparent that Intellectual Property laws contains a drawback and due to which the big corporations can misuse the techniques of traditional knowledge for their own benefit. All the mentioned laws have seemed constantly failed to protect the rights of the people of indigenous communities and most importantly to prevent the act of biopiracy of the traditional knowledge. The complete present picture looks like the traditional knowledge is a free source for the commercialization and an open instrument which can be used for the purpose of profit earning without providing any compensation or at least the deserving reward to the people of indigenous communities because of whom such companies are able to earn such huge trade profits.

Although, recent amendments in the Indian Patent laws recognized certain rights of Indigenous communities relating to their traditional knowledge. The new provisions provide for the mandatory disclosure of claims and the mandatory proof of geographical origin of the biological material, which is being applied for the grant of patent in India, by the use of Invention. There are more provisions included in the Patents Act, 1970 such as section 10(d)(ii)(d), section 25(j) and section 64(p) which all are added to specifically deal with the wrongful or non-disclosure of geographical origin or the places from where it belongs in order to make it open for the grounds of opposition, revocation or rejection of the patents if it has been granted.

Moreover, the additional provision added such as section 25(k) in order to provide additional rights of indigenous

[12] Biopiracy related to Traditional Knowledge & Patenting issues. Suvarna Pandey Patent Attorney S. Majumdar & Co. New Delhi - PDF Free Download, http://docplayer.net/55491028-Biopiracy-related-to-traditional-knowledge-patenting-issues-suvarna-pandey-patent-attorney-s-majumdar-co-new-delhi.html (last visited Dec 11, 2019).

[13] *Ibid*.

[14] Dabur India Limited vs Colgate Palmolive India Ltd, AIR 2005 (2004).

[15] Rao and Guru, *supra* note 11.

[16] Biopiracy & Related Issues, SIMPLY DECODED, http://www.simplydecoded.com/2013/07/14/biopiracy-related-issues/ (last visited Dec 11, 2019).

communities to protect the traditional knowledge from being patented which were anticipated about invention from available local knowledge including oral knowledge also, as one of the grounds of opposition for the purpose of revocation of such patents [17].

The important case of India which directly deals with regards to the rights of Indigenous communities is Kani Tribes (arogyapacha) Case [18], which covers the facts relating to development and marketing of the herbal-based stimulant and tonic, Jeevani developed from the plant arogyapacha used by kani tribe (Kerala) from ages. Where this issue ultimately stands for the benefit-sharing through the sharing of inventorship rights, provided guidelines for shared licensing agreement and common benefit sharing through its patent.

International Treaties and Conventions

It is very crucial to understand that the act of biopiracy includes very complex and arduous in nature as this act seems omnipresent and somehow finds its relation in every branch of law. This concept is on one hand supports the rights of patent owners and on the other hand violates the rights of the people of indigenous communities who all already possess the knowledge relating to such biological resources as they have traditional knowledge over the product which is being patented by the big corporations dealing with the research of such product.

Moreover, there are one set of laws relating to IPR or International Trade laws relating to IPR or any other commercial matters which mainly focuses on the part of profit maximization and there are other sets of laws which all are framed with the objective to protect the environment and also respects the rights of indigenous communities. The divergence between these laws ultimately led to the 'difference of interest' between these two sets of groups i.e., the rights of corporations and the rights of Indigenous communities.

1. TRIPS Agreement

The initiative of World Trade Organization with the aim to provide an international framework for the protection of Intellectual Property Rights leads to the implementation of Trade Related aspects of Intellectual Property Rights (TRIPS) agreement in the year 1995 [19].

The successful support for the implementation of TRIPS Agreement providing unique form of Intellectual Property Rights also resulted in the negative development of the act of biopiracy which also emerged as one of the major drawbacks also encapsulated by various member countries who ratified the TRIPS Agreement [20].

a. Doctrine of Sui Generis

The provision of Article 27(3)(b) of TRIPS Agreement enumerated that a member states to provide protection to the varieties of plants either through the medium of patents or through the *sui generis* system or both [21]. However, it does not indicate the appropriate nature of the sui generis model which is being referred for the protection. This resulted in various controversies between the least-developed and developed countries [22].

TRIPS agreement also recognized the rights relating to Geographical Indication in order to identifying the geographical origin of such particular product. According to Article 22.3 mentioned under the TRIPS agreement, if the registration of trademark which uses a geographical indication in a way to deceive or mislead or in a way to confuse the user relating to difference of the products must be liable to get refused or if granted then will be invalidated ex-officio [23]. The above–mentioned statement was also quoted in the case of Basmati Rice.

b. Doctrine of Common Heritage of Mankind

The explanation under Article 1(1) of FAO's International Undertaking on Plant Genesis Resources for Food and Agriculture, 1983, which states that the undertaking is based on 'the universally accepted principle that the biological resources are the common heritage of mankind and that it should be available without restriction' [24]. In simple words, it means that no one can claim the absolute rights over such biological resources.

2. Convention on Biological Diversity

The Convention of Biological Diversity, 1992, not only provides the recognition to the dependency of indigenous communities on the biodiversity and biological resources and also their important role in conserving such resources to maintain the balance of ecosystem [25]. This is the main reason due to which the convention on biological diversity enumerates that the parties have undertaken to protect, preserve and maintain the ancient traditional techniques, practices, knowledge and innovation done by the people of indigenous communities which looks directly related to the protection and conservation of biodiversity.

Article 8 of the Convention on Biological Diversity enumerated and emphasized on the promotion of wider application with the prior approval of knowledge holders in order to develop the equity sharing of benefits from the use of such biological resources from biodiversity. Moreover, this convention also recognizes the sovereign rights of the state over its biological resources [26].

3. Nagoya Protocol

The Nagoya Protocol provides a mechanism for the access to the genetic resources and relating to benefit sharing which was ratified in the year 2010 through which the Convention on Biological Diversity can be made applicable as it acts supplementary to the convention. The Nagoya Protocol mainly deals with the process of access and benefit sharing.

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[17] Dr.Vishwas Chouhan, *Protection of Traditional Knowledge in India by Patent: Legal Aspect*, 3 IOSR JOURNAL OF HUMANITIES AND SOCIAL SCIENCE 35–42 (2012).

[18] Using Traditional Knowledge to Revive the Body and a Community, https://www.wipo.int/ipadvantage/en/details.jsp?id=2599 (last visited Feb 22, 2020).

[19] Dipan Adhikari, *Biotechnology, Gene patenting, vis-a-vis Bio-piracy of indigenous germplasm: Unveiling the Pandora's Box.*, https://www.academia.edu/15269970/Biotechnology_Gene_patenting_vis-a-vis_Bio-piracy_of_indigenous_germplasm_Unveiling_the_Pandora_s_Box (last visited Dec 11, 2019).

[20] WTO | intellectual property (TRIPS) - Reviews, Article 27.3b, traditional knowledge, biodiversity, https://www.wto.org/english/tratop_e/trips_e/art27_3b_e.htm (last visited Dec 11, 2019).

[21] *Ibid.*

[22] Adhikari, *supra* note 22.

[23] WTO | intellectual property (Article 22.3 TRIPS) - agreement text - standards, https://www.wto.org/english/docs_e/legal_e/27-trips_04b_e.htm (last visited Dec 11, 2019).

[24] Article 1(1) FAO, Rose, *supra* note 6.

[25] Home | Convention on Biological Diversity, https://www.cbd.int/ (last visited Dec 12, 2019).

[26] Biosafety Unit, *Article 8(j) - Traditional Knowledge, Innovations and Practices* (2019), https://www.cbd.int/traditional/ (last visited Dec 11, 2019).

The Nagoya Protocol aims to ensure the better regulation for the access of genetic or biological resources and also tend to promote the state to establish an agency from where the researchers, scholars and firms can seek appropriate permission or they can request for the operating licenses. This state should also provide an adequate equitable mechanism for the sharing of benefits arises from the use of such genetic or biological resources and to provide appropriate regulations to monitor trade related changes in the market from time to time [27].

Battle Against Biopiracy: Indian Perspective

India is considered as one of the 17 mega-biodiversity countries having almost 2.4 percent of the global land area and carries 7 to 8 percent of the officially recorded species of the world which makes it even more attractive for the cases of biopiracy [28]. So far, as per all the above-mentioned cases related to India. In most of them, India has successfully overturned the number of granted patents to the giant companies dealing with traditional knowledge of the developed countries by various patent offices over the resources and knowledge. This case given a way to battle against the act of biopiracy. Moreover, it is crucial to understand that this was one of the first attempt where third world country fought and succeeded against developed country as well as giant corporations by objecting and opposing the granted patents by various patent offices to such giant corporations as it was based on India's traditional knowledge practices in the country from generations.

- **Domestic Statutory Mechanism**

To prevent the 'pirates' from successfully exercising the act of biopiracy and through its own various bitter experiences, the first and foremost step taken by India can be highlighted in accordance with the provisions enshrined under the *Constitution of India* (Article 48A & 51A(g) [29].

The government of India came up with Biological Diversity Act, 2002 [30]. This Act aims to perform various functions one of the most important among them is also a regulatory access to these biological resources in a way by eliminating the unfair commercial exploitation. The main purpose of this Act is to protect, conserve and recognize the traditional knowledge of the people of local or indigenous communities by providing them equitable share of profit for what they deserve such recognition. Also, the Patent Act, 1970 requires "*mandatory disclosure of source and geographical origin of the biological material in the specification when used in an invention"* [31]. It is pertinent to note that if party fails to provide appropriate disclosure or they are participating in any form of wrongful disclosure of such information, then any future change, alteration or amendment may lead the application for the objection or revocation of the patent [32].

- **Monitoring Mechanisms and Ongoing Efforts**

There are various monitoring programs have been put in place in several ecosystems as well as for particular species in India, such as:

Monitoring of genetic variation using techniques such as DNA fingerprinting under the Laboratory for the Conservation of Endangered Species (LaCONES) [33]

The concept of protected area network is developed in India which has been used as a tool to manage natural resources for biodiversity conservation and for the well-being of resource-dependent populations. So far, India has established a network of 679 Protected Areas (PAs), extending over 1,62,365.49 km2 (4.9% of the total geographic area) and comprising 102 National Parks, 517 Wildlife Sanctuaries, four Community Reserves and 56 Conservation Reserves. This wildlife protected areas also include 39 Tiger Reserves and 28 Elephant Reserves, along with 6 World Heritage Sites within UNESCO's framework. Scientific monitoring and traditional observations confirm that depleted natural resources are being restored and/or pristine ecological conditions have been sustained in well-managed Pas [34].

The Indian government also initiated the program to launch the Traditional Knowledge and Digital Library (TKDL) in the 2001 [35]. The new project opened a digital library for the purpose of identification of India's indigenous and biological resources. Through this digital library, the sourcing patent form different books in the local language by translating it into five different languages in order to make it accessible to the masses. It primary goal is to identify the usages, characteristics and bibliographic sources of different plants and trees and then to translate it.

The main intention behind establishing this digital library is to set up a competent and rigorous mechanism to create anteriority near to the traditional knowledge to protect it from the cases of biopiracy done by the giant corporations. In order to battle against such act of biopiracy and unethical patents, the library is set up a repository of 1200 formulations of different systems of Indian medicine, such as medicines, Unani and Siddhas. The library also has 50 traditional Ayurveda books and made available online [36].

Conclusion

The act of biopiracy is rampant in recent times and it is necessary to provide watchful restriction to such acts as its elimination is the need of an hour, especially for the countries like India, who have large number of indigenous communities and for the countries rich of traditional knowledge. Many times, developed countries tries to downplay the term 'piracy' with relation to 'biopiracy' by stating that the patents on such traditional knowledge does

[27] The Nagoya Protocol, IUCN (2016), https://www.iucn.org/theme/global-policy/our-work/convention-biological-diversity-cbd/nagoya-protocol (last visited Dec 11, 2019).

[28] Sangeeta Udgaonkar, *The recording of traditional knowledge: Will it prevent "bio-piracy"?*, 82 CURRENT SCIENCE 413–419 (2002), www.jstor.org/stable/24106653 (last visited Dec 11, 2019).

[29] Environment Protection under Constitutional Framework of India, https://pib.gov.in/newsite/PrintRelease.aspx?relid=105411 (last visited Dec 11, 2019).

[30] Biological Diversity Act – 2002 - GKToday, https://www.gktoday.in/gk/biological-diversity-act-2002/ (last visited Dec 22, 2019).

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not contravenes or prevent the practices and use of such genetic and biological resources by such indigenous communities who all are using it from ages. However, it is important to note that such act does have negative effects on the cultural rights of such indigenous communities which such developed countries or big corporation fails to recognize.

Therefore, the act of biopiracy leads to the commodification of the traditional and indigenous knowledge at the cost of suffering to the people of indigenous communities for their legitimate rights. The umbrella legislation for the appropriate legal recognition of such traditional knowledge of indigenous communities to be enforced at domestic as well as at International level with the support of first world countries.

Suggestions

By considering all the above already mentioned remarks, the suggestive measures enumerated and provided through this seminar paper are as follows:

a. Harmonization between Convention on Biological Diversity (CBD) and TRIPS:

In order to deal with the problems of biopiracy effectively, it is important to create harmonization between the rights of indigenous people for traditional knowledge with the rights of those who takes benefit from such traditional knowledge which can be made possible by harmonizing Convention on Biological Diversity (CBD) and TRIPS. Such harmonization can be done by making the condition of patent as compulsory for the compliance with the terms and regulations of the Conventions on Biological Diversity (CBD). As India already argued for the amendment in Article 27(3)(b) of TRIPS agreement on the grounds that patents which all are mostly based on the traditional or indigenous knowledge or it is to be furnished with disclosure of geographical origin of such biological resource it relies upon and along with proof having consent of such indigenous communities for such use.

b. The regulations relating to operation and maintenance of Digital Libraries:

Along with creation of digital libraries, it is very crucial to build a mechanism for the maintenance of digital library for its systematic and smooth functioning. The database of biological resources should be maintained in a way that such big corporation cannot exploit any traditional knowledge without any rightful claims through the disclosure of such traditional knowledge.

c. Systematizing and unifying laws for the Indigenous Communities:

The countries having major number of indigenous communities should appropriate the nature of sui-generis laws in their legislation for the due recognition of rights of such indigenous communities over their traditional knowledge. The famous example is Philippines which provided the Indigenous Peoples Rights Act, 1997 for providing indigenous communities the appropriate rights over their traditional knowledge and biological resources. The groups of least developed countries may also come-up with the conventions and treaties by aiming to protect the rights of the people of indigenous communities between them.

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