CHAPTER: V

ISSUES AND CHALLENGES TO TRADITIONAL KNOWLEDGE AS IPR PROTECTION

5.1 Introduction

“What kind of a civilization is it, what kind of humanism is it that plunders and destroys the sacred sites of power of traditional cultures due to its measureless hunger for resources and energy, that in its mania for progress literally walks over corpses, and everything that cannot be integrated and digested is shoved aside in blind ignorance and usually destroyed? Can such a humanism, can such a civilization truly speak about justice and human rights and praise all these high ideals without losing its credibility?”

The abovementioned statement is sufficient enough to understand the situation of traditional knowledge and issues pertaining to the same. Traditional knowledge has always been an easily accessible treasure and thus has been susceptible to misappropriation. The traditional knowledge, particularly, related to the treatment of various diseases has provided leads for development of biologically active molecules by the technology rich countries. In other words, traditional knowledge is being exploited for bio-prospecting. Also Traditional knowledge is often misappropriated, because it is conveniently assumed that since it is in public domain, communities have given up all claims over it. Traditional Knowledge includes both, the codified or documented as well as non-codified information which is ordinarily not documented but may be orally transmitted.

Issues relating to protecting, recognizing and rewarding of traditional knowledge associated with biological resources are very complex. The

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modalities for protecting traditional knowledge are still emerging and evolving. The nature of entitlements and share in benefits is also a grey area. Even at the international level, clarity has not yet emerged and countries are grappling to understand the issue. With regard to the protection of knowledge, innovation and practices associated with biological resources, these do not seem to fall in the conventional legal system of IPR protection. These conventional forms of IPRs are inadequate to protect indigenous knowledge essentially because they are based on protection of individual property rights whereas TK is by and large collective. Further, the informal knowledge presents other difficulties in being recognized for the purpose of intellectual property protection, such as knowledge is developed over a period of time any may either be codified in texts or retained in oral traditions over generations. The conditions of novelty and innovative step necessary for grant of patents are therefore not satisfied. Communities quite often hold knowledge in parallel. Nevertheless, the development of an appropriate form of protection for the knowledge of local communities is of great interest to countries which are rich in biodiversity, and also rich in traditional knowledge.\(^3\)

Any discussion on the subject of protection of Traditional Knowledge, Genetic Resources, Traditional Cultural Expressions and folklore has to answer basically four major questions:

1. Why is protection important?

2. What needs to be protected?

3. What are the protection modalities?

4. In what way can the owners of Traditional Knowledge benefit from the protection system?

While there has been no agreement on the definition of traditional knowledge, it would include all traditional scientific and medical knowledge or practices, unique verbal expressions i.e folktales, musical expressions i.e.

\(^3\) Supra note 4, p.409
folk music and tangible expressions i.e. textile, pottery, sculpture, jewellery, medicines etc. Protection is important to the owners, since traditional knowledge can be treated as a valuable tradable commodity bringing economic benefits to the owners, while simultaneously ensuring that such knowledge is not eroded or destroyed. For example, indiscriminate use of medicinal plants without ensuring sustainability through conservation has led to massive endangering of valuable plant bio resources. Similarly, due to lack of documentation and poor dissemination of knowledge by chance or by design as a protective mechanism, much of indigenous knowledge is getting irretrievably lost. Moreover, multinational companies routinely exploit such knowledge to gain commercial benefits through the patenting system. In the absence of searchable database disclosing existence of such knowledge as prior art, patent office grant patents on the use of this knowledge to produce useful products. The patents on turmeric for wound healing which was revoked by USPTO on the basis of CSIR’s evidence of prior art, karela, brinjal and jamun for diabetes, neem formulations as insecticides and fungicides, Phyllanthus amarus for its anti-viral activity etc. highlight the compulsions faced by traditional societies to ensure protection of their knowledge based from unauthorized exploitation.4

It is rightly said that today’s society is the knowledge based society. Today’s market is also a knowledge based market. In this competitive age, only those nations will survive and flourish who have the potential to convert the knowledge into wealth. Persons, who are able to transform their knowledge into formal specification, will success in intellectual property regime. On the other side, people at large do not have the capacity to transform their knowledge into formal specification and consequently into wealth. Some people who are hampered because of their poverty, illiteracy, isolative habitat, lack of information and technological gadgets are unable to convert their knowledge into wealth. On the other hand, some are able, strong

and potent to use traditional knowledge for profiteering. Some of the cases are illustrative to understand this issue.$^5$

1. The big business houses, hoteliers, film industries and music tycoons are using cultural expressions of nomadic, tribal and village community.
2. Rich traditional knowledge heritage is widely used by pharmaceutical industry. Traditional knowledge is used in allopathic and ayurvedic medicines.
3. Village community, tribal and indigenous people have traditional knowledge of biodiversity. They are conserving knowledge of biodiversity, which serve largest genetic resource for breeding activities but some giant companies are making huge profit through IPR regime.

The above illustrations are clearly provides that the traditional knowledge included hereinabove, needs protection. It is rightly observed that it will be more pragmatic to focus on the cost of conservation of indigenous and local communities as a guide to designing economic incentive that will help them to gain adequate rewards. Different interest groups including industry, intellectual property experts and indigenous and local communities and their organization need to cooperate in order to define mechanisms for more effective sharing of benefits with the providers of traditional knowledge and genetic resources.

5.2. Significance for Protection of Traditional Knowledge

The following are very important grounds for the protection of traditional knowledge.

1. Traditional knowledge has potential of being transformed into wealth by providing leads/clues for development of useful practices and processes for the benefit of mankind.

$^5$ Supra note 225, p.309
2. The valuable leads/clues provided by the traditional knowledge can save time, money, investment of modern biotechnology and other industries into research and product development.  

3. Existing IPR system is based on individual private property rights. Traditional Knowledge is incompatible with current IPR system because it emphasized collective creation and ownership.

4. In traditional knowledge system, information is classified into basic four groups –
   (a) Information known to society with or without documentation and is in consistent use by people e.g. common use of neem and turmeric.
   (b) Information is well documented and available to the public for examination and use e.g. ayurvedic text, information in the palm leaves
   (c) Information that is not documented or commonly known outside small group of people and not revealed outside the group e.g. tribal knowledge.
   (d) Information known only to individuals and members of families e.g. cure of asthma by Goud family using specific fish variety as a means for a dispensing anti-asthmatic drug.

   It is required to be noted that the information which falls within public domain do not satisfy IPR criterion i.e. new, non-obvious, innovative. Thus, IPR system is inimical to protect traditional knowledge.

5. Only protection of traditional knowledge system will provide an effective benefit sharing mechanism, which is enshrined in new IPR legislation.

6. It is not fair that traditional knowledge is appropriated for commercial use without sharing of benefit. Appropriations will violate indigenous cultural percepts by encouraging the commodification of such knowledge.

7. Protection of traditional knowledge will be helpful in contesting false claims of IPR

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8. Traditional knowledge base of plant-based medicine may enable India to accelerate drug development.  

5.3. Issues of Bio Piracy

This century is the century of knowledge. The frequent advancement of science and technology has made knowledge a valuable commodity and due to the increased importance of knowledge, the concerns relating to intellectual property have also increased compared to the previous era. The development and progress have resulted into the detrimental side effect and one of such side effect is bio piracy. Bio piracy is the unauthorized or uncompensated use of biological resources and traditional knowledge which belongs to other countries and their local and indigenous communities which are mostly developing countries. Today, genetic resources and traditional knowledge associated with those resources play an important role in different areas of society and industry which are mostly plants and animals, food and beverages, horticulture and industrial biotechnology.

Bio piracy is a phenomenon which has recently started getting international attention. There is no official definition regarding the concept. The term is relatively new and it is being used first time in the early 1990s and it is closely related to the term bioprospecting which is also being used in the same period. The term bioprospecting is defined in the Oxford Dictionary as “the search for plant and animal species from which medicinal drugs and other commercially valuable compounds can be obtained”.

As the issue of bio piracy is highly controversial, it is no surprise that the terminology is equally contested. Being a derogatory term, bio piracy is often replaced by terms as ‘unauthorized access’ and ‘misappropriation’. This is how definitions of these terms are increasingly entangled, yet defined differently by every author. Many critics say that there is no such word or thing like bio piracy. The argument with regard to this is most of the corporate

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7 Supra note 225, p. 333.
people are simply acting as per the existing international property laws. It is also stated that the idea of sovereignty over natural resources and biodiversity not only provides nations with rights but also imposes some obligations, which countries sometimes forget. As a consequence, governments should blame themselves for the failure to protect their biodiversity and for not putting limits on the research on and appropriation of biological resources. Such arguments are very harsh towards developing countries, but they do present some rational points therefore they deserve some special consideration.  

As it has been discussed earlier, bio piracy is not a term with an accepted legal meaning. Various scholars, activists and politicians has given various meaning as per the requirements. The term bio piracy is defined in the Oxford Dictionary as “the practice of commercially exploiting naturally occurring biotechnical or genetic material especially by obtaining patents that restrict its future use, while failing to pay fair compensation to the community from which it originates”.

Medicinal plants and traditional knowledge both are preexisted with the indigenous community, tribes or local people. As there is no proper documentation and exclusive rights of patent is granted to those parties who are not the real owner of the TK. The conflict arises for the interest of the trade and profits are made by the patent holders and they never disclose the knowledge to others. Moreover, the national and international conventions did not define the medicinal plants, TK holder and patent holder. Provisions for sustainable use of resources and maximum number of exploitation of the resources by the patentee are also not available. Novelty, non-obviousness and utilization of TK for commercial benefits all these are need to be recognized. Only the TK is not to be preserved but the biodiversity, the resources, culture of the local people should be recognize and preserved. In the recent past, there have been several cases of bio-piracy of TK from India. First it was the patent on wound-healing properties of turmeric. Now patents have been obtained in other countries on

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hypoglycemic properties of bitter gourd, brinjal etc. An important criticism in this context relates to foreigners obtaining patents based on Indian biological materials. There is also the view that the TRIPS Agreement is aiding the exploitation of biodiversity by privatizing biodiversity expressed in life forms and knowledge. Patents are granted under national patent laws and have territorial application only. The TRIPs Agreement provides minimum standards of protection for intellectual property rights including patents, while WTO members are free to grant a higher level of protection under their national laws. Thus, India is free to deny patents in life forms, except on micro-organisms and microbiological and non-biological processes, as per the provisions of the TRIPS Agreement. At the same time, if for example, the US chooses to grant patents on plants or other life forms, we cannot object. Nevertheless, such patents will have force only in the US and cannot be enforced in India.

To assess the WTO compatibility of a patent granted by a foreign patent office to an invention based on biological material obtained from India, we need to check whether the criteria of patentability i.e. novelty, non-obviousness and usefulness are satisfied, and to challenge it where the criteria are not met. We examine cases that need to be examined. A patent granted in the US on the wound healing properties of turmeric, for example, was revoked after such an examination, similarly, a patent granted on the neem as a fungicide was revoked in the European Patent Office in May 2000. The exercise could be extended to other such patents also. The time, effort and money involved in getting individual patents examined and revoked in foreign patent offices is huge. Hence, an internationally accepted solution to such bio piracy is a necessity.  

The problem of bio piracy may not be resolved with such revocation actions and domestic biodiversity legislation alone. There is a need to provide appropriate legal and institutional means for recognizing the rights of tribal communities on their TK based on biological resources at the international level. There is also a need to institute mechanisms for sharing of benefits arising out of the commercial exploitation of biological resources at the

11 Source: WTO documents: WT/CTE/W/156 and IP/C/W/198
international level. There is also a need to institute mechanisms for sharing of benefits arising out of the commercial exploitation of biological resources using such TK. This can be done by harmonizing the different approaches of the Convention on Biological Diversity on the one hand and the TRIPS Agreement on the other, as the former recognizes sovereign rights of States over their biological resources and the latter treats intellectual property as a private right. India has proposed in this context that patent applicants should be required to disclose the source of origin of the biological material utilized in their invention under the TRIPS Agreement and should also be required to obtain prior informed consent of the country of origin. If this is done, it would enable domestic institutional mechanisms to ensure sharing of benefits of such commercial utilization by the patent holders with the indigenous communities whose TK has been used. Simultaneously, provisions have been introduced for disclosure of the source of biological material in the amendments proposed to the Patents Act 1970 through the Patents (Amendment) Act 2005. What is required in addition to prevent bio piracy is the acceptance of this practice of disclosure and PIC by all patent offices in the world.

Protection of Traditional Knowledge has always been a matter of interest in view of the biodiversity rich countries like India. The knowledge of such kind has always been in the hands of the indigenous and local communities which are being exploited on large scale without a share of profit being handed over to them. These resources are used in such way that leads to bio piracy. The unique nature of such knowledge makes it unfit for protection by the existing legal structure. As social structure became complex and human settlement pattern evolved from primarily tribal societies to complex villages and even more complex, the notion of THINE & MINE began to manifest more and more in human life. The concept of private property has been developed and it has been spread from tangible objects to intangible phenomenon such as knowledge intellect and ideas. The creation of the legal concept of Intellectual Property was evidenced to this extension of the scope of ownership. In this way, traditional knowledge is a main valuable asset to the local community on which their livelihood depends and it is an enabling tool for better management of their local eco-system. The traditional knowledge is used as an input to
modern industries such as pharma, botanical medicines, cosmetics, modern wear, agriculture, and biological pesticides and so on. Thus protecting traditional knowledge has the potential to improve the performance of many developing countries’ economy by enabling greater commercial use of their biological wealth and increasing exports of traditional knowledge related products.

Several academicals studies on traditional communities provide ample evidences that the protection of traditional knowledge can provide significant environmental benefits. Much of the world's crop diversity is in the custody of farmers who follow age old farming and land use practices in ecologically complex agricultural systems which enable the conservation of biodiversity. Bio-piracy of codified Indian traditional knowledge continues, since, this information exists in regional languages, and there exists a language barrier due to which the patent offices are unable to search this information as prior art, before granting patents. Formulations used for the treatment of human ailments from traditional knowledge are time-tested since they have been in practice for centuries. The reliability of the traditional medicine systems coupled with the absence of such information with patent offices, provides an easy opportunity for interlopers for getting patents on these therapeutic formulations derived from traditional medicine systems. The grant of patents on non-patentable knowledge which relates to the traditional medicines, which is either based on the existing traditional knowledge of the developing world, or a minor variation thereof, has been causing a great concern to the developing world. Some of the examples are discussed herein under for the bio-piracy of traditional knowledge and in many of these cases the country had to fight for revocation of the granted patents. Revocation may not be a feasible option possible for all the patents taken on the traditional knowledge since it involves huge costs and time. Patent examiners, in the international patent offices, while examining the patentability of any claimed subject matter, use available resources for searching the appropriate non-patent literature sources. Patent literature, is usually wholly contained in several distinctive databases and can be more easily searched and retrieved whereas non-patent literature prior art is often buried somewhere in the many and diverse sources. Therefore, a need was felt
to create more easily accessible non-patent literature databases on traditional knowledge of India.

The reasons for protection of traditional knowledge are ethical, economic, scientific and moral. The question of preserving traditional knowledge never arose for thousands of years / centuries, however, it has become very significant today. Various attempts to get intellectual property protection on naturally occurring substances have alerted developing countries like India about the value of traditional knowledge. Such countries began to realize the importance of traditional knowledge only after the scientific advanced nations of west started granting Intellectual Property Rights to traditional knowledge in their own nations and even to that which actually disseminated from local and indigenous communities living in developing nations of the World. Such use can be termed as Bio Piracy whereby unauthorized extraction of biological resources or traditional knowledge of developing countries are done for obtaining patents without giving compensation to the original knowledge holders. Patent is an exclusive right given by the Government to the inventor for the invention. For getting patent, the criteria are Novelty, Utility and Inventiveness. Novelty means, the Invention must be totally new or original which is not under the knowledge of any other person. Utility refers to practical usage and industrial application of any invention. Inventiveness means non obviousness which means the invention must be such which is not obvious and it is advanced in technology comparing to the knowledge of any person skilled in that technology. After getting patent over the invention, the patent holder can prevent anybody from using or producing that invention. Some of the eye opening cases in this respect are discussed here:

5.4. Case Studies for Bio Piracy Issues

5.4.1. Turmeric Patent Case

Turmeric is considered as a native plant of south Asia which is grown in India for thousands of years. It is used in Indian system of medicine in all forms including paste, powder, decoction, and oil etc.
for internal and external application. Its medicinal qualities such as wound healer, antiseptic, blood purifier, pain reliever and cosmetic purposes are a common knowledge in India. Turmeric, scientific name *Curcuma Longa* a plant of ginger family yielding saffron colored rhizomes is multipurpose. In India it has been as spice for color for cooking. It also has some other medicinal qualities. In Indian Ayurveda, Turmeric is use as medicine for wound heals, for inflammation and sprains.\(^{12}\)

On 28\(^{\text{th}}\) March 1995, two expatriate Indians at the University of Mississippi Medical Centre namely Suman K. Das and Hari Har P. Cohly were granted a US patent no.5401504 on use of turmeric in wound healing. The patent was assigned to the University of Mississippi Medical Centre, USA in the year 1995 by the US Patent Trademark Office (USPTO) for wound healing power of the Turmeric and it was claimed as novel invention. It was acknowledged that “*turmeric has long been used in India as medicine for treatment of various sprains and inflammatory conditions*”\(^{13}\). There was no specific scientific research on the turmeric for its external wound healing nature that was also claimed by them.\(^{14}\) It was challenged by The Council of Scientific & Industrial Research (CSIR), New Delhi, India to re-examine with the USPTO to reclaim. CSIR came up with the argument that turmeric has been for so many purposes from ancient time in India. It also has the power to heal the wounds so the use of it was known tall and there was no novel invention. Their argument which was supported by documentary evidence related to TK of India. A Sanskrit text was provided and also a paper which is published in Journal of the Indian Medical Association in the year 1953. It was challenged as a theft by the Indian Government. In 1997 the patent was

\(^{12}\) “Abduction of Turmeric Provokes India’s Wrath” Good News India (January 2000<http://www.goodnewsindia.com/Pages/content/traditions/turmeric.html> accessed 16\(^{\text{th}}\) May 2016

\(^{13}\) Ibid.

\(^{14}\) Ibid.
revoked by the USPTO. After knowing that it was already known in India from ancient time and there was no novelty.

Despite an appeal by the patent holders, the USPTO upheld the CSIR objections and cancelled the patent. The US Patent Office revoked this patent on April 21, 1998, after finding that there was no novelty and the so called findings by innovators were already known in India for centuries. This case also showed that how our medicinal plants and Traditional Knowledge are exploited through bio piracy.\textsuperscript{15}

The turmeric case is landmark case. For the first time patent was challenged successfully because the patent was based on TK of the Southern Asia (mostly India). Had the patent been not revoked, the turmeric cannot be used by the Indian medicinal companies for medicinal purpose or wound healing.\textsuperscript{16} As India is very reach for its biodiversity and it is also a developing country, so there is a very high chance for infringement of TK and natural resources which is known as “Bio piracy”. The Government of India is concerned about bio piracy of the biological resources which is unique in nature. They took measures to stop the bio piracy by the developed countries. Local and indigenous communities are the victims when their knowledge and natural resources is infringed due to very high prices of the product.\textsuperscript{17}

5.4.2. Neem Patent Case

Neem, scientific name \textit{Azadirachta indica}, is a tree from India and other parts of South and Southeast Asia. Neem tree is legendary to India. It is used for so many purposes. Mostly it is used against pests and fungal diseases which attack to food crops. Neem Oil is extracted from the seeds and it is used to cure cough and cold, flu and cosmetics. Medicine for malaria is made from it. Skin diseases can be cured by it. It also provides relief for meningitis. The oil extracted

\textsuperscript{15} <http://www.tkdl.res.in/tkdl/langdefault/Common/Biopiracy.asp?GL=Eng> Accessed on 16\textsuperscript{th} May 2016
\textsuperscript{16} Ibid.
\textsuperscript{17} Ibid.
from its seeds can be used to cure cold and flu and mixed in soap; it provides relief from malaria, skin diseases and even meningitis. Moreover it use for diabetes, instance, constipation, antiseptic, toothbrush etc.\textsuperscript{18}

In 1971, a patent application was filed in the year 1971 by Robert Larson who was an importer of timber. It was filed on the basis of pesticides of Neem. In 1988, the exclusive patent right was transferred to the American Corporation W.R. Grace and Corporation in. the chemical treatment was invented for pesticides. The innovation could be transferred and used widely throughout the world.\textsuperscript{19} On 14\textsuperscript{th} September 1994, the Patent No 436257 was granted by the European Patent Office granted a European to the US Corporation W.R. Grace and the United States Department of Agriculture for a “method for controlling fungi on plants by the aid of hydrophobic extracted Neem oil.”\textsuperscript{20}

Dr. Vandana Shiva, Director, Research Foundation for Science, Technology and Ecology, Ms. Linda Bullard of International Federation of Agriculture Movements and Ms. Magda Aelvoet a green party member of European Parliament filed a legal opposition to the grant of this patent on the ground that the fungicidal effect of hydrophobic extract of Neem Seeds was known and used in India for centuries in Ayurvedic Medicine to cure skin diseases and in agriculture for controlling fungal infection in plants. In June 1995, a legal opposition was filed by the Green Group in the European Parliament, Research Foundation for Science, Technology, and Natural Resource Policy, India, and the International Federation of Organic Agriculture Movements, based in Germany against the

\textsuperscript{18} Michael Blakeney, “Protection of Traditional Knowledge by Geographical Indications” in Cameron May, The Law of Geographical Indications (London: The Blissett Group, 2007) 363 <http://books.google.ca/books?id=8vO0EJied1wC&printsec=frontcover#v=onepage&q=false> accessed 19\textsuperscript{th} May 2016


\textsuperscript{20} Ibid.
The application was enclosed with the evidence that the fungicidal effect of hydrophobic extracts of Neem seeds were already known and had been used for centuries on a large scale in India. To cure skin problems in Ayurveda and protect the crops from fungal infections both has been practiced in India. It was also argued that there were lots of lacunas in the patent application. The Neem patent application did not hold any novelty or inventive step for the grant of a European patent. According to European Patent Convention patenting of plant varieties is prohibited and that should be revoked. In 1999, the EPO argued that all character of the patent application was already existed in the public domain and it did not recognize the novelty and inventive steps. In 2000, the patent was revoked by the EPO. The decision was changed by the EPO on the fungicidal properties of the seeds extracted from the Neem tree. Subsequently with adequate evidences of traditional use of the fungicide in India, the EPO revoked the patent on 10th May 2000 on the ground that there was no inventive step which is required in any patentable invention. Against this order, the assignee preferred an appeal and EPO finally revoked the patent rights on 8th March 2005 by stating that there existed Traditional Knowledge in India relating to the use of the neem plant and there was no novelty and invention.

In India the Neem tree is famous as the source of Traditional Medicine. Indian Ayurveda and ancient texts described the healing quality of the Neem tree. The Neem Patent is one of the landmark bio piracy patent cases which was revoked by the European Patent Office.

21 Supra note 274
22 Ibid.
23 Ibid.
24 Ibid.
5.4.3. Basmati Rice Case

Rice is very necessary aspect for life for the people of the Asia. It is the foundation of their food and culture. The Basmati Rice is famous for the fragrance and aroma. It is known as the “queen of fragrance or the perfumed one.” Usually it has been grown up and founded in the foothills of Himalayas for thousands of years. Special kind of climate made the grain is aged to decrease the content of moisture in it. Agricultural and Processed Food Products Export Development Authority (APEDA) confers that “India is the second largest producer of rice after China, and grows over a tenth of the world’s wheat.”

In September 1997, a Texas based company named, Rice Tec. incorporation, was granted a patent for the new variety of Basmati Rice in September 1997 by the US patent office. The Company claimed in its patent application that a new of aromatic rice was developed by interbreeding Basmati with another variety. Later on it was named as Texmati and Kasmati. Rice Tec Inc. became famous in the international market for producing and selling the Basmati type rice. An application was given to the UK Trade Mark Registry Office for the trademark registration of Texamati. Patent No. 5663484 was issued on 2nd September,1997 to the Rice Tech Inc. company on Basmati rice lines and grains. After patenting the Basmati Rice in the name of Texamati that was affecting the farmers of India and Pakistan. India lost the international market for importing the Basmati Rice. They lost India 45000 tons US import market and also 10% of the total Basmati exports. For this the European Union, the United

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27 Ibid.


29 Supra note 281

30 Ibid.

31 Ibid.
Kingdom, Middle East and West Asia were suffering from that. More over as the long grain aromatic rice grown in the foot hills in India, so granting the patent on it is violating the fundamental fact of it. Patenting to the Basmati Rice is like violating our history and cultural heritage. The Patent was objected by the two Indian Nongovernmental Organizations (NGOs) named Centre for Food Safety and Research Foundation for Science, Technology and Ecology both the Organization filed legal petitions in US. It was also opposed by The Centre for Scientific Research. The Trademark registration of the Texamati was strongly and successfully objected by the Agricultural and Processed Food Exports Development Authority (APEDA). Numerous issues were raised like –

a) Whether the term Basmati is a generic one to describe aromatic rice, or does it refer specifically to the long aromatic rice grown in India and Pakistan?
b) Whether the strain developed by Rice Tec involves novelty?
c) Whether Rice Tec is guilty of bio piracy?
d) Whether US government’s decision to grant a patent for the prized Basmati rice violates the International Treaty on Trade Related Intellectual Property Rights (TRIPS)?
e) Whether the basmati patent should be revoked in the light of protests from India?*

All these issues were analyzed and it was observed that the variety of the Basmati Rice was already existed in India. So the patent should not be granted to the variety of the Basmati Rice. The company gave up with the claims of the patent application and it became the matter of bio piracy. All the claims which were made by the Rice Tech were rejected. Despite of this the evidence was submitted by IARI

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32 Supra note 281
34 Ibid.
35 Ibid.
(Indian Agricultural and Research Institute) to the US Patent Office and the patent application was revoked by saying that it was the straight matter of theft of Basmati Rice. The USPTO illustrated the matter of bio piracy. Out of 20 claims, 15 have been withdrawn and struck down and the USPTO confirmed the patentability of three claims of original patent relating to specific varieties bred by Rice Tec. Other two claims were amended for a narrow scope.  

Basmati Rice is sample of rice variety which belongs to the Himalayan foot hills of India. This case is one of the best examples of loss of cultural and traditional values. Case is the best example of loss of cultural value. As the patent was not novel and it was obvious because the rice was already imported to US, the case also determined the provisions of TRIPS for granting the process of biological procedures. The rice is also found in the South Asia. The decision of the case made a history in India. It was the victory of the farmers of India and Pakistan. If the patent was not rejected the farmer have to suffer the economic losses.

5.4.4. Jamun Patent Case

‘Jamun’ is known as ‘Syzygium Cumini’ which is indigenous fruit of India. It is found all over the India. The fruit named ‘Jamun’ contains iron, vitamins and minerals. It prevents the heart troubles, thyroid and liver problems. The Jamun seeds are used as antibiotic in India and it is the traditional knowledge of India.

In 1999 a patent was granted on US. Cromak Research Inc. a US based Company which was situated in New Jersey, wherein, they applied for patent on Jamun. The assigners were three non-resident Indians, namely Onkar S. Tomer, Kripamath Borah, and their colleague, Peter Gloniski.  

It was claimed by the US Company to use

\[36 \text{Supra note 1}
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the Jamun as anti diabetic for treatment. The invention was not true
because it was already in the public domain in the India. It was
challenged on the ground of prior art. According to patent system, no
patent should be given to the knowledge which is existed in the public
and the patent is only granted for the new invention which is novel and
non-obvious. Patent provide exclusive rights to the inventor for their
novel inventions.

As the Jamun and the knowledge is already existed in India, the
patent no 5900240 was challenged on the ground of prior art and
obviousness of the invention. However, Sec. 102 of the US Patent law
that defines prior art does not recognize technologies and methods in
use in other countries as prior art". Because of this, the Jamun could
be patented in the USA. It was recognized and also treated as the
matter of bio piracy which is theft of Indian TK.

5.4.5. Atta Chakki Case

Atta is known as flour and Chakki is a manufacturing machine
which is used to make Atta. The machine is mostly used to make South
Asian Breads such as Puri, Nan, Roti, Chapati etc. Atta is extracted
from wheat. The Chakki is used to grind the wheat for fine ground
Atta.

In August, 1998, a patent application was filed for the method
of Atta or Flour by the three inventors named Salem Ali, Sarath K.
Katta and Sambasiva R. Chigurupati through ConAgra Inc. The patent
was granted by the USPTO to the ConAgra Incorporation. The method
for producing Atta or Flour was recognized as invention and the patent
no. 6098905 was granted. It is currently using across the South Asia.

38 Supra note 292
39 " India Needs To Document Traditional Knowledge” The World Trade Review (January 15,
0>, accessed 19 June 2015
as Atta or Flour. According to the patent provisions “changes, variations, modifications, and other uses and applications that do not depart from the spirit and scope of invention”\textsuperscript{40} The invented machine and the mechanism was described as grinder for wheat. Wheat is passed through the machines which produce the cracked wheat and the cracked wheat is passed through two smooth rollers to make it as flour or Atta.

As it is the very traditional way to make Atta or Flour so the ConAgra cannot claim any patent on the invention. The method was similar to the Atta Chakki which was already known to Indian people. People of Asia use the mechanism to produce the wheat flour. It was already existed in the public knowledge. It was identified as the case of piracy of mechanisms or theft of stealing the method. The method of the local communities of Asia was simply copied by the applicant company. The pre-existing knowledge was only developed by the company and they wanted the exclusive monopoly right over the method. As the invention is described by the patent provision of US which include modification and variation of any invention so they are eligible for patent. The company wanted the monopoly and exclusive right to control over the wheat flourmills in India and other Southern Asia countries. Finally it was decided that they were trying to establish a monopoly right over India and other South Asian nations, so the patent should be valid in US.

5.4.6. Monsanto BT Brinjal Controversy

Monsanto is a US based agricultural company which was founded in 1901 in USA. It has a branch in India named as Monsanto India Limited. A Transgenic Brinjal named “\textit{Bacillus Thuringiensis (BT) Brinjal}” was invented by inserting a gene cry1 Ac. The gene was created from the soil of bacterium. It was created to protect the Brinjal

\textsuperscript{40} Supra note 294
plant against the insects. BT Brinjal was created by the Mahyco, India’s number one seeds company with the collaboration of American multinational Monsanto. Both the companies improve the crops and help the agricultural division.

Monsanto was in partnership with the Mahyco in 2010. They modified and developed the BT Brinjal which is ‘Genetically Modified Organism (GMO)’ Brinjal. An objection was raised by the farmers and scientist. They were worried about the negative consequences of Mayhco Monsanto’s BT Brinjal on the human health, the environment and other local varieties. They ban it for the public benefit. A legal action was taken against Mayhco Monsanto and their collaborators by the National Biodiversity Authority (NBA) for theft. It was alleged by the NBA that six to nine Indian varieties of brinjal was accessed by the Mayhco Monsanto to modify and develop the vegetable. The prior permission was not taken from the NBA and other local board.

A complaint was lodged by the Environment Support Group (ESG) with the Karnataka Biodiversity Board, against the Monsanto that they negotiate the India’s sovereign control over its biological resources and they also ignored economic and social benefits to the local and indigenous communities of India under the Access and Benefit Sharing Scheme.

A criminal prosecution was initiated in 2012. It was also argued that the applicant company was trying to commercialize the indigenous knowledge of India which was also violating the provision of Biodiversity Act, 2002. Moreover they were stealing the local crop for

41 A GMO is a plant, animal or microorganism whose genetic code has been altered, subtracted, added in order to give it characteristics that it does not have naturally.
modification without the prior permission. Along with this, it was argued by the Indian that they developed the strains of eggplant grown in India over generations and Monsanto has no right to come in and build a product of their own indigenous species. All the allegations, which were made by the Indian Government, were denied by Monsanto with the explanations that their object is to maintain the public health and integrity of farmers.

The BT Brinjal was temporary banned in 2011. In August 2011, initially a judgment was passed by the NBA as it was the matter of bio piracy. NBA bought the charges against the developer of the BT Brinjal’s which consists Mahyco, Indian universities and research organisations.

It was the clear case of theft of the genetic materials. Moreover, it was a direct case of bio piracy of TK and genetic resources which belongs to indigenous communities of India. The Use of the TK and genetic resources might be exploited and that the protection should be provided to the rightful holder.

5.4.7. Kava (Piper Mythesticum)

Kava is an important cash crop in the Pacific, where it is highly valued as the source of the ceremonial beverage of the same name. Over 100 varieties of kava are grown in the Pacific, especially in Fiji and Vanuatu, where it was first domesticated thousands of years ago. In North America and Europe, kava is now promoted for a variety of

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uses. The French company L’Oreal has patented the use of kava to reduce hair loss and stimulate hair growth.45

5.4.8. Ayahuasca (*Banisteriopsis Caapi*)

For generations, Shamans of indigenous tribes throughout the Amazon basin have processed the bark of *B. caapi* to produce a ceremonial drink known as ‘ayahuasca’. The Shamans use ayahuasca, which also means ‘wine of the soul’, in almost all religious and healing ceremonies to diagnose and treat illness, meet with spirits and divine the future.

An American national, Loren Miller obtained a US Patent for Plant No. 5751, issued in 1986 which granted him rights over an alleged variety of *B. caapi* which he had collected from a domestic garden in Amazon and had called ‘Da Vine’ and was analyzing it for potential medicinal properties. The patent claimed that said preparation Da Vine represented a new and distinct variety of *B. caapi*, primarily because of the flower colour.

The Coordinating Body of Indigenous Organizations of the Amazon Basin which is also known as COICA and it represents more than 400 indigenous tribes in the Amazon region, along with others, protested against the wrong patent that was given on a plant species called *B. caapi*. They protested that ayahuasca had been known to be native to the Amazon rainforest, and cultivated for generations for its traditional medicinal uses, so Loren Miller could not have discovered it, and should not have been granted such rights, which in effect, appropriated indigenous traditional knowledge. On applying for reexamination, the USPTO revoked the patent granted, on 3rd November 1999. However, the inventor was able to convince the

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45 Supra note 1, p. 78
USPTO on April 17, 2001 and the original claims were re-confirmed and the patent rights were restored to the innovator.\textsuperscript{46}

5.4.9. Quinoa (\textit{Chenopodium Quinoa})

Quinoa is a staple food crop for millions in the Andes, especially Quechua and Aymara people who have bred a multitude of quinoa varieties. One traditional quinoa variety, Apelawa, was the subject matter of the US patent No. 5304718 which was held by two professors from the Colorado State University. They claimed the variety’s male sterile cytoplasm is key to developing hybrid quinoa.\textsuperscript{47}

On the same line, there are few more examples available which focus on serious issues of bio piracy. The plant \textit{Phyllanthus amarus} is used for Ayurvedic treatment for jaundice, a US patent has been taken for use against Hepatitis B. The plant \textit{Piper nigrum} is used for Ayurvedic treatment for vitiligo which is a skin pigmentation disorder. A patent has been taken in UK for the application of a molecule from \textit{Piper nigrum} for use in treatment of vitiligo.\textsuperscript{48}

Looking at the above cases, it is clearly visible that traditional knowledge is in great danger. This kind of bio piracy is an assault on the biodiversity and invention in the traditional knowledge. India is not the only country to be a victim of such kind of misappropriation of biological resources and traditional knowledge. There are so many cases which are related to bio piracy of the South Asian Countries, those who are biologically rich.

These all case studies indicate the need for protection of traditional knowledge and implementation of proper legal system. An active participation of the indigenous community is necessary to protect the traditional knowledge. Present IPR system can be changed by changing the fundamentals of it. The necessities should be recognized

\textsuperscript{46} Supra note 1, p.79
\textsuperscript{47} ibid
\textsuperscript{48} ibid
for whom the laws are going to be made. The rights of indigenous people should be respected over their traditional knowledge through their development. By establishing the TKDL it will never stop the bio piracy. TKDL should define the indigenous communities of India and their rights over their traditional knowledge. The objective, scope, importance, purpose of such kind of documentation must be clear. Fair and equitable benefit sharing should be there. Moreover, as these tools are not existed in it and there is no law which can directly protect the TMK and stop bio piracy. These kinds of cases of bio piracy affect the indigenous communities of India. Indian patent system brings these kinds of problems in ethical manner.

5.5. Issues with regard to the Current Intellectual Property Regime

Traditional Knowledge refers to the long standing traditions and practices of certain regional, indigenous or local communities. Traditional knowledge also encompasses the wisdom, knowledge, and teachings of these communities. In many cases, traditional knowledge has been orally passed for generations from person to person. Some forms of traditional knowledge are expressed through stories, legends, folklore, rituals, songs, and even laws. "Traditional knowledge" is not recognized as "knowledge" by all who study it since it includes beliefs, values and practices. Traditional knowledge includes information on the use of biological and other materials for medical treatment and agriculture, production processes, designs, literature, music, rituals, and other techniques and arts. These broad set includes information of a functional and of an aesthetic character, that is, processes and products that can be used in agriculture or industry, as well as intangibles of cultural value. Traditional knowledge is not static, it evolves and generates new information as a result of improvements or adaptation to changing circumstances.

Several proposals have been made in the current IPR system, to protect traditional knowledge. Such proposals are not sufficiently clear on the protection issue because of the diversity of traditional knowledge itself.
Therefore, a fundamental question, before considering how traditional knowledge may be protected, is to define in a form of need for the protection of traditional knowledge which may include various reasons including equity considerations, conservation concerns, preservation of traditional practices and culture, prevention of appropriation by unauthorized parties of components of traditional knowledge, and promotion of its use and its importance in development. Few experts opine to protect traditional knowledge under patent regime but the criteria of Novelty and Inventive Step will not be passed in case of traditional knowledge. Trade Secret method to protect traditional knowledge will also fail due to unavailability of Trade Secret related law in India. In such circumstances it is clear that current Intellectual Property System is not well equipped to protect traditional knowledge. However, certain steps are taken by India in furtherance of protecting traditional knowledge.

In 1995, the estimated market value of pharmaceutical derivatives from indigenous people’s traditional medicine was US $ 43 billion worldwide. Under current intellectual property law, there is no obligation for companies which utilize the traditional knowledge associated with medicine, possessed by the indigenous peoples to provide any compensation to recognize their equity in the commercial application of this knowledge. To be patentable, an invention has to be novel, involving an addition to the existing state of relevant technology. Novelty is assessed by reference to the prior art. Novelty will be destroyed by prior publication. A problem with the patent claims of indigenous peoples in relation to traditional knowledge and remedies is that it has been the practice of ethno botanists and ethno pharmacologists to publish accounts of the uses of plants by indigenous peoples. Another obstacle to the recognition of the contribution of indigenous people to the development of new drugs, are the fairly strict rules that apply to the concept of joint invention. Joint inventorship typically requires that each of the joint inventors must have contributed to the inventive conception, working towards the same end and producing an invention by their aggregated efforts. It is not necessary that they worked physically together at the same time and that each made the same type or amount of contribution. However, all must work on the same subject matter.

and make some contribution to the inventive thought and to the final result. The economic factor has played an important role in the agitation for the protection of traditional cultural works.

Proposals of mechanisms for the protection of TK have ranged across two axes. Along one axis are various suggestions to improve the private law rights of the creators or custodians of TK. These suggestions range from proposals to modify existing copyright law through to the creation of sui generis TK rights. Along another axis are suggestions to deal with the protection of TK as a public law right. These suggestions range from the creation of a public protection authority, through domain public payant proposals, to empowerment of indigenous peoples’ protective agencies. At the modest end of discussions concerning the protection of TK are suggestions to deal with the perceived inadequacies of existing intellectual property laws by supplementary legislation. It should be noted at the outset that a number of commentators have questioned whether TK is amenable to private law remedies.50

5.6. Position of Indigenous People

Indigenous peoples represent about 4% of the world’s population. There are at least 5000 different indigenous groups in the world. Indigenous people live in every region of the world but about 70% of them live in Asia. Indigenous peoples suffer higher rates of poverty, landlessness, malnutrition and internal displacement than the rest of the society, and have lower levels of literacy and less access to health services. The Amazon River Basin is home to about 400 different indigenous groups. While the land accounts for just 7% of the world’s surface area, it harbors more than half of its biodiversity. More than 100 pharmaceutical companies are currently funding projects to study indigenous plant knowledge and specific plants used by native healers. A recent study showed that ending the marginalization of indigenous peoples could expand the national economies of Bilivia by 37 %, Brazil by 13%, Gautemala

50 Supra note 4, p.401
by 14% and Peru by 5%. The Adivasi or tribal peoples of India constituted only 8% of the total population of the country but 40% of them are internally displaced.\textsuperscript{51}

Unfortunately, indigenous people pay a price for being different. They are among the poorest on the earth and some of their material poverty is a consequence of where they live. Many indigenous peoples live in areas with harsh climates, where poor soil conditions make it difficult to grow crops. Many also live in isolated upland regions which are far from economic and development support, in place lacking good roads, schools and health care. Indigenous peoples often endure political marginalization, discriminations and violation of fundamental human rights. Increasingly, they are being dispossessed of their lands and resources to make a way for development. Many have no documented land rights and in some countries, they do not even have citizenship papers. Too often, land is taken away from indigenous peoples for projects that benefit others. The intrusion into upland and forest areas to harvest timber, minerals and medicinal plants robs indigenous communities of their land and degrades its quality. In many parts of the world, indigenous forest dwellers are subject to penalties for using wood and other resources that have been theirs for generations. Sometimes, the unique cultures of indigenous peoples are seen as a threat. Indigenous populations can be pressured into assimilating with the dominant culture and changing their language, religion, customs and traditions. Frequently, state governments do not recognize their village councils and other traditional institutions. Marginalization of indigenous peoples sometimes leads to armed conflict. Today, such communities inhabit many of the world’s conflict zones. Areas where ethnic minority groups have been subjected to extreme forms of civil rights violations are often hotbeds of insurgency.

Indigenous populations can be pressured into assimilating with the dominant culture and changing their language, religion, customs and traditions paying the price for being different. There are about 300 million indigenous peoples living in more than 70 countries worldwide. Although such peoples are

\textsuperscript{51} Supra note 70
extremely diverse, there are two characteristics that help to define them as a group. The first is that they have an historical continuity with societies that resided in their territories before the development of colonial societies and modern states. The second is that their social and cultural identities are different to those of the dominant groups in their societies. Indigenous groups may vary considerably in their traditions and circumstances, but they all want to protect their unique cultures.  

5.7. Issues With Regard to the Third World Countries

The consensus statement of Global Health Forum I, February 2000 said that “the move to globalize the protection of intellectual property is not politically sustainable without, at the same time, making the delivery of health technology more equitable.” On April 2001, the United Nations Commission on Human Rights called on governments to ensure the accessibility of pharmaceuticals and medical treatments used to treat pandemics such as HIV/AIDS, as well as their affordability for all in accordance with international law and international agreements. The resolution also calls on governments to safeguard access to such preventive, curative or palliative pharmaceutical or medical technologies from any limitations by third parties. However, the recent landmark event on medicines HIV/AIDS in South Africa has raised a new question in this regard. The adoption of the TRIPS Agreement has entitled significant changes for the protection of pharmaceutical products and processes. The Agreement not only made product patent protection binding to all member countries, it also strengthened inter alia, process patents narrowly defined the conditions for establishing exceptions to patent rights and limited the possibility of applying especial modalities of compulsory license to pharmaceuticals.

A key question is whether the TRIPS regime has led to an increase in the prices of patented medicines. Although many researchers argue that there is no clear relationship between the patents and the prices of medicines, there is strong evidence that average pharmaceutical product prices decline in the face

52 Supra note 70
of entry by generic substitutes. Competition is important to keep prices down. There are a number of options available within TRIPS to ensure affordable access. Compulsory licensing, parallel imports and differential pricing between developed and developing countries have been suggested as instruments to improve access within the broad framework of TRIPS. But it is not clear as to the kind of legal instrument that could be used to enforce differential pricing and segment markets. It is also not clear as to whether TRIPS regime is compatible with national exhaustion or international exhaustion. There is an additional problem with differential pricing in those developing countries, which have capacity for producing generics. They will slap on anti-dumping duties because of the pressure from domestic industry. Under the differential pricing regime, one will have to decide as to how to organize competition based on negotiated prices. There is also a fear that if one segments markets in pharmaceuticals in this manner, there will have for international competition in other sectors. The full implementation and application of the TRIPS Agreement will entail welfare losses to varying extent depending on the economic status of individual countries. The question is about the extent of this loss and what should be done to mitigate the adverse consequences.\textsuperscript{53}

International agencies will have to make an effort to bridge the gap between the developed world and the third world. Some laudable efforts are afoot in this direction. WIPO is setting up WIPONET to narrow the information access gap that exists between the developed countries and developing countries, improve the flow of information concerning intellectual property rights among WIPO member states, regional intellectual property offices and the International Bureau, to improve access to and exchange of intellectual property information dissemination, to consider the information needs and filing requirements of applicants and develop electronic services keeping in mind the need to provide benefits to applicants and intellectual property offices, and to other interested parties, to help guide the International Bureau to leverage information technologies and to improve the retrieval of intellectual property information through further development of international

\textsuperscript{53} Supra note 70
classifications of patents, trademarks and industrial designs as efficient search tools.

Inadequate preparedness of many national IP offices in most of the developing countries is a serious concern. The problem areas pertain to manual and paper based operations, static manpower resources, rapid increase in the number of applications filed in recent years leading to inordinate delays in granting IPRs, non-uniformity in the examination, poor quality of search resulting in fresh objectives even after the first examination report, inadequate search facilities and tools and lack of digital data & networks. Most seriously, IT has not yet been included in the IP administration in most cases. The question of capacity of the third world IP offices to handle complex IP issue is a serious one. In the year 2000, WIPO received 30 patent applications, which were over 1000 pages long, with several reaching 140000 pages. It is clear that the patent offices in the developing countries may not even have a capacity to handle these issues.

The third world faces several other challenges. Weak physical infrastructure in terms of inadequate IP offices, as explained above, is just one aspect, but inadequate intellectual infrastructure, poor public awareness and lack of government policies that are not in tune with the times are some other hurdles. Many R&D institutions and industrial firms in the developing world have so far focused on imitative research or reverse engineering, and have depended heavily on borrowed technology and therefore, not created productive national IP portfolio. Apart from manpower planning for IPR protection setting up of patent training institutes and specialized courses, a judicious management of patent information is needed. This will require well-structured functioning of information creating centers, information documenters and retrievers, information users and information technology experts.

Internet can play a key role in the protection and promotion of traditional knowledge of the communities. An example is the recent experiment in India of the design of an e-commerce portal for Indian craftsman and artisans, which will link individual craftsman directly to the designers and
markets. It will be possible through this portal for a garment buyer in any part of the world to approach any craftsman directly, select a pattern, a weave and a fabric and place his order with him. This will mean not only a multiple increase in the craftsman’s income but also his direct interaction with the market. This will unleash the creative skills to meet the demands of his market, and further enhance the innovation capacity. New challenges in IP protection will emerge as internet becomes a major facilitator in commercialization of traditional knowledge.

5.8. Core Problem for Traditional Knowledge Protection

Most indigenous people are proud of their diversity, their languages and knowledge systems. In fact, in some cases, these unique cultural assets may also help raise their standards of living. Over millennia, for example, many indigenous cultures have come to understand the importance of shifting cultivation, recognizing plants with healing powers and the sustainable harvesting of food, fodder and fuel wood from forests. Revitalizing this knowledge helps to improve food security, raise household incomes and foster self-esteem. Likewise, creating market links between indigenous communities and external buyers can increase incomes and reduce poverty levels. National and local economics can greatly benefit from indigenous people’s contributions to tourism and the sale of natural products. There are many ways of enabling indigenous peoples to overcome poverty, but one of the most effective is to support their efforts to shape and direct their own destinies. Strengthening organizations of indigenous peoples for example increase their ability to successfully negotiate with others on their own behalf. In this regard, more and indigenous people are seeking international recognition and the right to participate in defining agreements on issues that affect them, such as global warming.

Indigenous peoples constitute one third of world’s extremely poor rural people. Any effort to eradicate poverty must therefore address the special needs of these minority ethnic groups. For a host of political and historical reasons, indigenous peoples tend to suffer from neglect and discrimination. Many have
been pushed onto the least fertile and most fragile lands. In these isolated and harsh environments, many indigenous peoples find it difficult to grow enough food to eat, earn a living, receive an education and learn new skills, receive medical care and do what is necessary to improve their lives while preserving their cultural identity. Living far from center of commerce and power, they may also find it hard to influence the policies, laws and institutions that would improve their circumstances and shape their futures. Many indigenous peoples, for example, do not have the legal right to live on the lands they depend on for survival, or use the resources they have managed sustainable of thousands of years. Increasingly, outsiders exploit these resources, with few benefits flowing to indigenous communities and little regard for the natural environment.\footnote{Supra note 70}

International conventions and treaties dealing with indigenous knowledge are seldom, if ever implemented. ILO Convention No. 169, which says a lot about legal standards for indigenous rights, fails to protect the Intellectual Property Rights of indigenous people. Whereas the UN Declaration on the rights of Intellectual Property recognizes the rights and aspirations of the Intellectual Property, it will be a non-binding document, which cannot be legally enforced. In International Treaty on Plant Genetic Resources, developed nations have successfully blocked and international recognition of farmers Rights. They also contest any notion of paying for the use of traditional germplasm in a benefit sharing arrangement. The CBD, which has attempted to push through the interests of indigenous knowledge, has been thwarted by the American refusal to ratify it and accept its condition.

The industrial property systems were set up centuries ago for inanimate objects and that too in formal systems of innovation. The time has come to revisit them. The emerging challenge is to look at the systems that will deal with animate objects such as plants and animals and with informal systems innovation such as those by grass root innovators like farmers, artisans, tribes, fishermen and so on. The standard intellectual property systems will certainly not suit such innovators and their innovations. We, therefore, need innovation in the intellectual property system itself. The issue of whether TRIPS should

\footnote{Supra note 70}
fundamentally belong to WTO is under discussion. Other issues such as the desirability of uniformity of patent term need for new reforms to exclude certain sectors from TRIPS lowering the minimum standards, differential treatment depending the state of economy of a developing country etc. are also under discussion. It is important to recognize that the principal objective of the GATT/WTO system is to promote free trade. This can be done if competitive opportunities are provided across the nations on a non-discriminatory basis. The TRIPS provisions should be interpreted. In other words, the emphasis should be on promotion of competition, and not its restriction. The TRIPS provisions have to be interpreted in this context alone and especially, with an aim of laying down the foundation of a fair trade system. It is hoped that the third world concerns enumerated in this discussion will be addressed by a dialogue to create a new TRIPS plus getting a new meaning of TRIPS plus equity and ethics.55

In this way, it is clear that within the traditional knowledge systems, there are innovations and improvements by individuals and communities which need protection in order to incentivize investors for recovery of their investment. Proper economic value of traditional knowledge is to be seen in the herbal medicines and pharmaceutical sector which is expected to reach tentatively at 5 trillion by the end of 2020. The benefits must be shared legally with the holders of such knowledge. Patents on genetic resources and traditional knowledge should not be allowed on ethical, social and economic grounds. Traditional knowledge in many cases, when blended with modern science and technology, can generate immensely valuable solutions for societal problems and opportunities for the holders of such knowledge. Various issues faced by traditional knowledge are that they are not documented properly, the origin is very difficult to trace, the source of knowledge is often a person and it is very difficult to particularize it. It does not fit in the known form of IP regime as well as there is very less awareness available for such knowledge.56

55 Supra note 70
56 Supra note 41, p.139