CHAPTER 7

Indigenous Knowledge and Intellectual Property Rights: Issues for Knowledge Rights

It is often argued that the rights of the Indigenous peoples are being violated when their access to land and to benefits from their contributions to science and technology are ignored. This has been attributed, in a large measure, to the intellectual property protection sanctioned by the TRIPS regime which recognizes and rewards innovative activity that is ‘novel’ ‘non-obvious’ and usually of some benefit to the society. It has been argued that what is regarded as innovation ignores the form and the kind of innovative activity undertaken by the traditional and indigenous communities. In doing so, it has been alleged, the TRIPS regime becomes an international, legal institution that fosters the intellectual dominance of the western modern sciences and fails to acknowledge and reward global intellectual pluralism. This has become the background for varying claims: for the knowledge rights of the indigenous communities to be given parity within the TRIPS framework; for the protection of IK or TK; for an end to bio-piracy and the one-way genetic resource flow so reminiscent of the mercantile capitalism era; for the development of equitable benefit-sharing mechanisms; for community property rights, to name only a few of the central ones. These are all rights which emanate from the central claim for knowledge rights of the indigenous/ traditional peoples which are as much aspects of their socio-economic rights as rights to food or health. This chapter argues that existing intellectual property rights becomes a vehicle for the transgression of the knowledge rights of the indigenous peoples which are closely linked to issues of food and livelihood security. It seeks to advance the argument that intellectual property rights are rights that do not easily conjoin with other rights, knowledge rights of the traditional peoples in the context of this chapter, an attribute that becomes crucial when the moral basis of a right is weak.

Intellectual property rights are not compatible with the rights of the indigenous communities to use, conserve and benefit from the intellectual and biological resources that they have held for centuries. They are not compatible in two senses: one, that they threaten to alter the terms of the relationship between ecology and the communities dependent upon them, which had so far been governed by customary rights. Customary rights that exist in traditional communities are not written into law but lie at the very heart of secure livelihoods and survival options, especially of marginal, tribal, indigenous, farmer communities. These customary laws have offered timeless
protection to the traditional producer communities through their inalienable collective rights to resources, knowledge, markets and livelihoods. Two, as Vandana Shiva argues, as these customary rights get undermined, by individualized notions of intellectual property, traditional communities become vulnerable to piracy of resources and knowledge by commercial and corporate interests claiming exclusive intellectual property protection for the pirated resources and knowledge.¹ This chapter seeks to establish that the TRIPS regime infringes upon the knowledge rights of holders of different types and genres of intellectual resources, those intellectual resources which are crucially linked to the sustainability of their lives and their ecosystems. It threatens the plurality and heterogeneity of knowledge systems, threatening to alter these in the image of western intellectual traditions. Finally, it aims to argue that the threat that the current conception of intellectual property as individual rights poses to communally held knowledge rights, compels a re-thinking of the concept of intellectual property itself.

As in chapters 5 and 6, this chapter seeks to first locate knowledge rights in a case study – that of Neem – and from there draw larger conclusions about the inability of Intellectual Property rights to conjoin with other rights, especially rights which are aspects of human rights. Knowledge rights of the traditional peoples, it will be demonstrated are aspects of human rights as they are symbiotically linked with issues of subsistence and livelihood. To that extent knowledge rights of the traditional peoples are different from the knowledge rights that are protected by IPRs. The latter are more in the nature of economic entitlements that seek to claim a just compensation for their economic investments. It can be argued therefore knowledge rights need to differentiated into separate categories, one that is linked to a more fundamental right related to the claim for a dignified existence and subsistence and the other which is more in the nature of a right to secured returns on capital investment. It is the former, i.e., the right of traditional, indigenous peoples over their knowledges and associated resources, which a human rights claim.

THE NOTION OF TRADITION/INDIGENOUS KNOWLEDGE ²

Traditional knowledge (TK) is the information that people in a given community (who identify themselves as indigenous to a place, based on a combination of cultural distinctiveness and prior territorial occupancy relative to a more recently arrived population, with its own distinct and

² See Chapter 4 “Knowledge as Intellectual Property”, for a brief discussion on preferred nomenclatures
subsequently dominant culture (ILO, 1989: Article 1), based on experience and adaptation to a local culture and environment, have developed over time, and continue to develop. This knowledge is used to sustain the community and its culture and to maintain the genetic resources necessary for the continued survival of the community. Traditional knowledge includes mental inventories of local biological resources, animal breeds, and local plant, crop and tree species. It may include such information as trees and plants that grow well together, and indicator plants, such as plants that show soil salinity or that are known to flower at the beginning of the rains. It includes practices and technologies, such as seed treatment, storage methods and tools used for planting and harvesting. TK also encompasses belief systems that play a fundamental role in a people's livelihood, maintaining their health, and protecting and replenishing the environment. TK is dynamic in nature and may include experimentation in the integration of new plant or tree species into existing farming systems or a traditional healer's tests of new plant medicines. The term “traditional” used in describing this knowledge does not imply that this knowledge is old or untechnical in nature, but tradition based. It is “traditional” because it is created in a manner that reflects the traditions of the communities, therefore not relating to the nature of the knowledge itself, but to the way in which that knowledge is created, preserved and disseminated.

The development of IK, covering all aspects of life, including the management of the natural environment, has been a matter of survival to the people who generated these systems. Traditional knowledge is often collective in nature and is therefore considered the property of the entire community, and not belonging to any single individual within the community.

Such knowledge systems are cumulative, intergenerational, representing generations of experiences, observation and trial and error experiments. Most of this knowledge and these skills have been passed down from earlier generations, usually through oral traditions, but individual men and women in each new generation adapt and add to this in a constant adjustment to changing circumstances and environmental conditions. These knowledge systems therefore innovate from within, are dynamic, constantly evolving and adapting to changing situations.

5 Exceptions like witchcraft, 'tantric' skills etc do exist where the form of knowledge is closely held by a family or a very small group of individuals
6 TIK systems are stored in people's memories and are exchanged and passed down to generations through stories, folklore, proverb, songs, myths, rituals, community laws and language. It is transmitted through specific cultural and traditional information exchange mechanisms, for example, maintained and transmitted orally through elders or specialists (breeders, healers, etc.), and often to only a select few people within a community.
Various definitions highlight the aforementioned features. According to Warren and McKiernan “Indigenous Knowledge (IK) is local knowledge- knowledge that is unique to a given culture or society”. Furthermore as Maurial states “Indigenous knowledge is local because it is the result of the quotidian interactions in indigenous people’s territories”; or in Dei et al.’s words, “indigenous knowledges are those acquired by local peoples through daily experience”. Traditional knowledge is thus the totality of all knowledges and practices, whether explicit or implicit, used in the management of socioeconomic, spiritual and ecological facets of life. Categories of these traditional knowledges include agricultural, meteorological, ecological, governance, social welfare, medicinal and pharmaceutical, legal and jurisprudential, music, architecture, sculpture, textile manufacture, metallurgy and food technology.

An important facet of TK/IK is that it exists in a symbiotic relationship with the ecology which sustains it. Perhaps that is the reason some theorists have preferred the usage of the term “traditional ecological knowledge’ (TEK) to any other because of the vital linkages that these knowledge systems have with their environment. Writing about the American Indians Capra stated that ecological awareness arises “only when we combine our rational knowledge with an intuition for the nonlinear nature of our environment. Such intuitive wisdom is characteristic of traditional, non-literate cultures, especially of American Indian cultures, in which life was organized around a highly refined awareness of the environment”. As Firket Berkes writes, “Traditional ecological knowledge (TEK) represents experience acquired over thousands of years

9 Dei, George, Jerry Sefa, Budd L. Hall and Dorothy Goldin Rosenberg, Indigenous Knowledges in Global Contexts: Multiple Readings of our World (Toronto: University of Toronto Press, 2000),19
10 For details on categories of indigenous knowledge see Odora Hoopers, Culture. Indigenous Knowledge and Development. Johannesburg: CEPD, 2004), Section 2.2; The UNESCO’s World Intellectual Property Organization’s definition of cultural heritage includes: Literary, performing and artistic works (including music, dance, song, ceremonies, symbols and designs); Languages; Scientific, agricultural, technical and ecological knowledge (including medicines and sustainable use of flora and fauna); All items of movable cultural property including burial artifacts; Indigenous ancestral remains; Indigenous human genetic material (including DNA and tissues); Cultural environmental resources (including minerals and species); Immovable cultural property (including indigenous sites of significance, sacred sites and burials); Documentation of indigenous peoples’ heritage in all forms of media (including scientific, ethnographic research reports, papers and books, films, and sound recordings).
of direct human contact with the environment. Hardesty (1977:291) defined TEK as a branch of ‘ethnoscience’ (folk science) as a “study of systems of knowledge developed by a given culture to classify the objects, activities, and events of its universe.” The ecosystem then exists in a functional relationship with the lives of traditional people. The knowledge of this ecosystem is in turn linked to the subsistence and livelihoods of the people who are part of this ecosystem. Thus when we talk of the issue of knowledge rights of the traditional indigenous peoples one has to bear in mind that ecological milieu in which it exists is crucial to the survival strategies of these communities.

IK is frequently referred to as alternative, informal forms of knowledge.\(^{13}\) It is understood as an alternative to the formal, rational, scientific knowledge. Although some writers reject this contraposition, ‘indigenous knowledge’ is commonly contrasted, implicitly or explicitly, with a ‘global’, ‘cosmopolitan’, ‘western’, ‘formal’ system of knowledge.\(^ {14}\) It is generally employed as an umbrella concept\(^ {15}\) to cover practices, skills, customs, worldviews, perceptions, as well as theoretical and factual understandings of indigenous, local, traditional people whose ways and system of negotiating with nature are vastly different from that of modern western science.\(^ {16}\) The relationship with and to nature, human agency and human solidarity, for instance, underpins the knowledge system and the human existence around it. The unique cosmology and the world view of the traditional societies underline all categories of their implicit and explicit knowledges making them non-individualistic, essentially communal making them non amenable to propertization or for any kind of proprietary claims to be made on them.\(^ {17}\)

Berkes summarizes the essential differences, based on, he admits, broad generalizations which would hold true for all baring exceptions: In general TEK differs from scientific ecological knowledge in a number of substantive ways:

1. TEK is mainly qualitative (as opposed to quantitative);


\(^{16}\) For more details of the contrast and the interface between TIK and Western Modern Sciences see Chapter 4.

\(^{17}\) F. Berkes, *Traditional Ecological Knowledge in Perspective*.
2. TEK has an intuitive component (as opposed to being purely rational);
3. TEK is holistic (as opposed to reductionist);
4. In TEK, mind and matter are considered together (as opposed to a separation of mind and matter);
5. TEK is moral (as opposed to supposedly value-free);
6. TEK is spiritual (as opposed to mechanistic);
7. TEK is based on empirical observations and accumulation of facts by trial-and-error (as opposed to experimentation and systematic, deliberate accumulation of fact);
8. TEK is based on data generated by resource users themselves (as opposed to that by a specialized cadre of researchers);
9. TEK is based on diachronic data, i.e., long time-series on information on one locality (as opposed to synchronic data, i.e., short time-series over a large area).

These contrasts are a necessary outcome of their alternate cultural and social contexts. It may be argued that TEK systems are so differentiated and so fundamentally different from western modern sciences (WMS) that that their respective alternate vocabularies render them incommensurable entities. What has perhaps compelled a comparison of TEK with western modern sciences (WMS) is the fact that in recent times, more specifically in the post TRIPS era, there has been a growing interest in alternate ways of healing, growing crops, alternate gene banks, in short there has been a growing demand and a need to tap the resources and knowledge base of these hitherto relatively secluded regions and peoples.

The Value of Traditional Knowledge, Efforts and Terms of Integration

A growing number of scientists, and policy makers are aware of the contribution traditional indigenous knowledge (TIK) can make to a more sustainable development\(^{18}\). IK also seems to be relevant to the scientific world for a number of reasons including issues of protection of biodiversity\(^{19}\), and the fact that IK could be used as the starting point in the construction of a truly


\(^{19}\) Masa Iwanaga, "In situ conservation and the development process" in, strengthening the scientific basis of in situ conservation of agricultural biodiversity on-farm: options for data collecting and analysis. Proceedings of a workshop to develop tools and procedures for in situ conservation on-farm, 25- 29 august 1997, eds., Jarvis, Debra I. and Toby Hodgkin (International Plant Genetic Resources Institute, Rome. Italy. 1998), vi

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alternative agriculture (Flora 1992, Kloppenburg 1991)\textsuperscript{20}. IK is being lauded as “alternative wisdom” relevant to a society which is increasingly confronting the limits of its science. That western science alone provides biological and ecological insights is no longer accepted unequivocally. As Berkes puts it, IK is being regarded as an “alternative collective wisdom relevant to a variety of matters at a time when existing norms, values and laws are called into question.”\textsuperscript{21} There is thus felt a pressing need to establish some kind of a dialogue between these systems in order that the world at large can benefit from their wisdom and the resources. This has led to an intensified search for commercially profitable substances and resources among the ecosystems of indigenous peoples. The value of traditional cultures’ knowledge and resources and its commercialization has raised the issue of the ways in which traditional societies ought to be compensated for their contribution to the creation of commercial products as well as emphasized the need to protect their biological resources. It has highlighted the terms of integration dictated by the international conventions and institutions like the UPOV, TRIPS, CBD and so on. As Andrew Gray puts it, this “integration is not a symbiosis between dominant societies and indigenous peoples, the relationship is asymmetrical. Integration sucks indigenous peoples into the vortex of the national state-society – it is nothing less than controlled assimilation.”\textsuperscript{22}

The effort to source, integrate, exploit TIK systems has gradually acquired global dimensions. What began with pharmaceutical companies prospecting the rain forest resources and traditional knowledge bases for new therapeutic solutions now extends to exploring the local plant genetic resources, traditional/ local agricultural knowledge about crops, medicinal herbs, climatic requirements, ecology management and so on. Recent advances in biotechnology have increased the ability of scientists to investigate organisms at the molecular and genetic levels and to find ways to commercialize products developed from these investigations. Prospecting for biological materials like plants with medicinal or other economically valuable properties like fibre or oil is

\textsuperscript{20} Jack Kloppenburg (ed), “Seeds and Sovereignty: The Use and Control of Plant Genetic Resources,”. (London: Duke University Press, 1988); J. Kloppenburg, “Social theory and the de/reconstruction of agricultural science: local knowledge for an alternative agriculture,” Rural Sociology 56 (4) (1991): 519-548. Some agricultural research centers look at IK as a key component of sustainable agricultural practices; others have been in charge of researching and cataloguing existing IK. The Center for Indigenous Knowledge for Agriculture and Rural Development (CIKARD), established in 1987 at Iowa State University, is an example of the latter


becoming a dynamic and profitable enterprise. Benign biological products, often a product of the bio-diverse South, are being sought as substitutes for chemical products. For instance, the global market for herbal products, with its appeal ranging from pharmaceuticals, nutraceuticals and health foods to cosmetics, toiletries and ethnic products is estimated to reach US $5 trillion by 2020.\(^{23}\) The wisdom and resources held by the traditional peoples of the developing countries forms the basis of a large part of the growing biotechnological boom.

The intensification of interest in the commercial value of indigenous peoples' knowledge and resources and the subsequent institution of intellectual property rights, emergence of indigenous peoples as a legal, political and economic possibility was predicated on a series of ideological and practical shifts in the contemporary world system. Among the more obvious reasons for the emergence of intellectual property rights and indigenous knowledge and resources was the increasing interest on the part of pharmaceutical companies in the collection and use of biological resources during the late 1980s and early 1990s.

In terms of the structuring of capital incentives within the pharmaceutical industry, one of the most significant events to occur during that time period was the 1980 United States Supreme Court ruling that a human-made strain of micro-organism, genetically engineered to improve its ability to degrade crude oil, could be considered a patentable product because the strain was not a naturally occurring composition of matter.\(^{24}\) Prior to this ruling, it was generally recognized that living organisms and cells were "products of nature" and thus were not patentable. The Plant Patent Act 1930 (US) distinguishes between 'products of nature' and 'human-made inventions'. The Supreme Court's decision to allow the patenting of genetically engineered microorganisms had both ideological and material effects. At an ideological level, the Court's decision substantially broadened the scope of what is human-made thus reordering what fell within the legal categories of nature and culture. Simultaneously, at the level of social practice, patent applications for products using genetic material rose by almost 200 percent in the year 1981 following the Court's decision, and the cumulative equity invested in all types of biotechnology

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\(^{24}\) *Diamond v. Chakravarty*, June 16, 1980 447 U.S. 303, 206 USPQ 193. Genetic engineer Ananda Mohan Chakrabarty, working for General Electric, had developed a bacterium capable of breaking down crude oil, which he proposed to use in treating oil spills. In a 5-4 ruling, the court ruled in favor of Chakrabarty, and upheld the patent, holding that: A live, human-made micro-organism is patentable subject matter under [Title 35 U.S.C.] 101. Respondent's micro-organism constitutes a "manufacture" or "composition of matter" within that statute.
companies rose from fifty million dollars to over eight hundred million between the years of 1978 and 1981. In fiscal year 1990 alone, the US government spent more than $3.4 billion to support the R&D of biotechnological applications, most of it disbursed through the National Institutes of Health (NIH--$2.9 billion). The expansion of intellectual property rights in the United States to include microbiological material can thus be seen as an important motivation for pharmaceutical companies to investigate plant resources for use in medicinal products.

In addition to shifts in international and national intellectual property law, a series of technological advances within the pharmaceutical industry which helped to sustain support for natural product development, generated interest in the topic of intellectual property rights and indigenous peoples. Two technological developments in particular helped promote the biotech industry funding and operations: HTS (high-throughput screening) tools and the development of combinatorial chemistry and combinatorial biology. The advent of HTS, made possible the analysis of tens of thousands of plant samples per week. The development of combinatorial chemistry and combinatorial biology generated thousands of small molecular weight compounds for screening, thus creating the perfect match for HTS. HTS and combinatorial chemistry were significant steps in the development of the biotech industry. The enhanced recourse to genetic screening and bioinformatics within microbiology caused a profound change in the organization of research and development of biotechnology. As a consequence of this users and scientists have become more interconnected in the innovation chain. The development of biotechnology proved to the new driving force behind a particular segment of pharmaceutical industry and agro-based industries. A common feature of both these industries was their growing interest and reliance on indigenous knowledge and resources. The genetically resource rich South and the wisdom and the knowledge of local plant varieties proved to be the trigger for new innovations in biotechnology.

The third important event in this context was the United Nations Conference on Environment and Development (UNCED), which met in Rio de Janeiro in 1992 in order to consider the passage of the Biodiversity Convention (CBD). What the CBD did was to reconceptualize to whom biodiversity belonged. Specifically it recognized that nation states had sovereign rights over their biological resources, and that the access and use of those resources should be determined by

Historically biological resources were part of the ‘global commons’ based on the premise that they were the “common heritage of mankind. The moral position taken by the United Nations FAO buttressed this position stating that, “The major plants of the world are not owned by any one people [but] are [rather] quite literally a part of our human heritage from the past.” This meant, in other words, that plant genetic resources were free goods which entailed only the cost of collection. Free availability mandated unrestricted exchange of plant germplasm among plant breeders and other scientists. The norm of free exchange had been sufficient to maintain the relatively free international flow of plant genetic material stored in the gene banks of the world. The notion of state sovereignty over biological resources changed this. CBD might have had in mind the historical asymmetry in the flow of germplasm, which was largely unidirectional from the South to the North, in vesting states with an opportunity to regulate access to plant resources and to deny that access if they considered it to be inimical to their national interests. *State ownership of biological resources re-conceptualized these resources, and the knowledge embedded within them, as something that belonged to an entity* (in the case of nation states) or to people (in the case of indigenous peoples or private owners). The very language of ownership, property and hence compensation that the *Convention* introduced in relation to biological resources was essential to the emergence of both the notion of intellectual property rights in biological resources as well as to the emergence of the debate on the rights that indigenous people possessed; rights to what now were considered “their resources” and “their knowledge.”

The final defining legal event to be considered here is the 1994 resolution to place intellectual property rights under the General Agreement of Trade and Tariffs (GATT), thereby creating international standards for intellectual property law and obliging member nations to commit to meeting these standards. Intellectual Property rights are legal entitlements which confer on the holders exclusive rights, often monopolistic in nature, in relation to the subject matter of the intellectual property. It provided profit incentives for innovation in various guises at monopolistic margins protected and ensured by the TRIPS legal framework. A significant contributing factor was/is the high profitability of these ventures which are converted into patented innovations. What adds to the profitability of these enterprises is the fact that the

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28 Article 8 (j): State Parties are required to “respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote the wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices.”
commercialized product is classified as an innovation and protected by the intellectual property regime through TRIPS. TRIPS became the driving force behind the spurt in industrial growth.

There are ample references which relate the universalization of the intellectual property regime to a spurt in industrial growth. Steven Price for example argues that some form of monopolistic control has been found necessary to propel western economic development for the last 2000 years: the progression of industrial society has coevolved with the development of the patent system. Calestous Juma has recognized the diminishing marginal productivity (or "diminishing returns") of previous technologies and the surge that patent protected biotechnology innovations have provided to the agro industries which has reorganized 'large sections of the industrial and agricultural sector'.

In this sense, at least, biotechnology is revolutionary: it is one of a series of circumventions of the recurring diminishing returns that characterize any intensive, centralized system. The more such a system expands, the more it must invest simply in self-coherence, resulting in less output. Gadbaw and Richards (1988,) estimate that the percentage of the US country exports with a high intellectual property content rose from 9.9% in 1947 to 27.4 % in 1986. Exports as measured by royalties and licensing fees amounted to about $27 billion in 1995, while imports amounted to only $6.3 billion. With the legal infrastructure supporting the approval of patents on genetically engineered micro-organisms and with these patents operating as virtual monopolies there began a continual search for sources of newer and greener fields which could yield newer avenues of innovation. Biological resources became very viable and profitable avenues for pharmaceutical research and development. Indigenous communities participated in ethnobotanical projects, which used/used indigenous knowledge to help facilitate the collection of particularly efficacious genetic resources.

33 Ethnobotanical knowledge or resources is used to refer to a community's knowledge about medicinal and alimentary uses of plants. This distinguishes the knowledge of the plants from the plant matter itself. Rural Advancement Foundation International (RAFI), a Canadian advocacy organization (now called Action Group on Erosion, Technology, and Concentration [ETC]), coined the term in 1994 as a spin on bioprospecting. RAFI/ETC publishes annual Captain Hook awards for notable achievements in biopiracy
The TRIPS regime had at least two far reaching effects in relation to the knowledge and resources of indigenous peoples. First, the agreement greatly altered how biodiversity was to be used and controlled. There was a shift in the way, and the norms according to which, nature was intercepted. Paul Rabinow remarks, writing about a particular kind of pharmaceutical technology, "Biotechnology’s hallmark lies in its potential to get away from nature, to construct artificial conditions in which specific variables can be known in such a way that they can be manipulated. This knowledge then forms the basis for remaking nature according to our norms".34 By conferring a property right to the biotechnological innovators it transferred the tacit rights that local communities had over generations to their local environment and resources, to a legal right that bio-prospectors could hold by freely accessing unprotected commons. TRIPS had no alternate conception of rights that could protect the traditional and indigenous societies’ knowledge and resources, both of which were held communally. Recognizing intellectual property of one kind and not recognizing the intellectual property rights of the other kind, the one that exists in a “non-scientific” paradigm, reinstated the notion of cultural and intellectual superiority of the West. As Pat Mooney of RAFI35 (Rural Advancement Foundation International) stated, “The argument that intellectual property is recognizable when performed in laboratories with white lab coats is fundamentally a racist view of scientific development”.

Secondly, the agreement greatly exacerbated the debate already raging between developed and developing countries over trade-related issues. It brought to fore the assumptions behind intellectual property rights, the dangers that it held for the food and ecological security of developing nations, and above all it brought into focus the issue of the knowledge rights of indigenous peoples and the inequity or absence of benefit-sharing mechanisms. The case study of neem, which is dealt with later in the chapter, highlights the issues of inequitable trade, non-existent or inequitable benefit sharing norms, bio-piracy all of which stem from the lower epistemic status granted to TIK in the hierarchy of knowledges. TRIPS is one of the mechanisms which facilitates and provides incentives, in the form of patents and related intellectual property rights, for the integration of global systems with these relatively isolated but resource-rich traditional knowledge systems. It is the effort to integrate, and the terms of this integration, that connects the knowledge debate with perspectives on human rights.

34 By Paul Rabinow, Making PCR: A Story of Biotechnology, 20
35 RAFI has been tracking US patent data bases for controversial ownership claims. In 1985 Pat Mooney of RAFI developed the concept of Farmers’ rights as a counter weight to plant breeders’ rights.
TRIPS AND INDIGENOUS KNOWLEDGE

There are two important international conventions that have a bearing on IPRs and indigenous knowledge systems. These are the WTO’s TRIPS and the Convention on Biological Diversity (CBD). The CBD is the only major international convention that assigns ownership of biodiversity to indigenous communities and individuals and asserts their right to protect this knowledge. Two articles of this convention are particularly relevant:

Article 8 (j): State Parties are required to “respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote the wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices.”

Article 18.4: Contracting Parties should “encourage and develop models of cooperation for the development and use of technologies, including traditional & indigenous technologies.”

Article 8j of the CBD recognizes communal knowledge and resources which is clearly at odds with the individualistic conception embodied in the TRIPS and the rejection of the “folklore” vs. “science” protection in Western patent law. The US, under President Bush, has refrained from signing the CBD, a decision which was made largely due to the Convention’s ambiguity regarding the IPRs. CBD, unlike TRIPS, recognizes the rights of indigenous cultures to preserve their knowledge and resources.

TRIPS is a key international agreement promoting the harmonization of national IPR regimes. The effect of this harmonization would be to provide minimum standards and to make national IPR regimes more similar to each other. Although TRIPS covers four types of intellectual property rights – Patents, geographical indications, undisclosed information (trade secrets) and

37 By putting IPRs in the WTO agreements, members are obliged to respect other members’ IPR commitments or, in case of non-compliance, to face trade sanctions by the WTO Dispute Settlement Mechanism.
38 For details see Graham Dutfield, Intellectual Property Rights, Trade and Biodiversity, (2000), 17. Box 3.1
trademarks – it does not acknowledge or distinguish between indigenous, community-based knowledge and that of industry. Furthermore, it makes no reference to the protection of traditional knowledge.

TRIPS requires WTO member states to make patents available for any inventions (whether products or processes) in all fields of technology, also on plant varieties and micro-organisms. (Article 27.3b). Without specifying, TRIPS demands that each country elaborates its own legislation provided it is internationally recognized and efficient. While there are provisions for *sui generis* systems related to plant varieties, (Art. 27 3(b)), it ought not to run contrary to the TRIPS provisions. *Sui generis* legislation for plant varieties may be determined by national legislation, provided only that the protection does not contravene the provisions of the TRIPS Agreement. The rationale behind the *sui generis* provision is that the claims of indigenous knowledge holders are based on completely different socio-cultural norms, therefore a system that is unique and rooted in local specificities should be used for the protection of indigenous knowledge.

Protection and enforcement of IPRs should according to Article 7 (Objectives), ‘contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of the producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to the balance of rights and obligations.’ This means that national IPR regimes need not be modeled after that of the US or any other country so long as they comply with the minimum standards laid out in Parts II and III of the Agreement. Article 1 (Nature and Scope of Obligations) makes clear that whilst members are required to implement the provisions of TRIPS, more extensive protection and enforcement are not precluded. Therefore, as Graham Dutfield states, the absence of any mention of TIK does not disallow a member from enacting legislation to protect such a category of knowledge. However

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39 27 3 Members may also exclude from patentability:
(b) Plants and animals other than micro-organisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes. However, Members shall provide for the protection of plant varieties either by patents or by an effective *sui generis* system or by any combination thereof. The provisions of this subparagraph shall be reviewed four years after the date of entry into force of the WTO Agreement.
what is of significant importance is that the other WTO members are not required to recognize rights in other countries that go beyond the minimum standards established by TRIPS. Thus even when countries do undertake sui generis legislation to protect a category of knowledge it very often fails to get protected at the global level as there are no global commitments to these legislations outside the boundaries of the legislating country.

Intellectual property is a legal concept that deals with creations of human ingenuity. These creations, whether they are inventions, designs, trademarks or artistic works, are considered to be property and are protected for a certain period of time, provided that their creators meet certain criteria. In the case of patents, the claimed inventions must be novel (that is, not publicly available or disclosed), convey an inventive activity and, in most jurisdictions, be capable of industrial application. For trade secrets, the knowledge must be of actual or potential commercial value. Although there is no reason why such categories of rights may not apply to various expressions of traditional knowledge, there are several characteristics of traditional knowledge that create barriers to protection through the use of existing forms of IPRs.

Possession is probably the single most important basis of defining intellectual property rights. Something that is capable of being delineated, with an identifiable author or inventor, is capable of being possessed or, in other words, propertized. On the basis of possession, knowledge may be categorized as individual knowledge, distributed knowledge and communal knowledge. Kibet A. Ng’etich drawing a distinction between individual knowledge, communal and distributed knowledge, states that knowledge can exist in either, or a combination, of these forms in all societies, including traditional societies. However, he adds that in traditional societies “the possession of knowledge by individuals... does not mean that such knowledge is perceived by communities as not belonging to them. Although, at any one time, knowledge may only be held

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41 For example, the knowledge of how certain plants within an indigenous group’s homeland are used to treat fever would fall under intellectual property rights. Likewise, particular understandings of the land, ecology, or environment of a certain area may also fall under intellectual property rights. The key point is that intellectual property rights refer to knowledge that otherwise would not be available. It is not knowledge gained through scientific experimentation, nor is it knowledge gained through empirical deductions. Rather, it is knowledge that is gained (some may say earned) through time, place, and experience.

42 For a few cases of existing intellectual property mechanisms, geographical indications, copyrights, trademarks and patents, that have been used to protect a few instances of TK see the WIPO document WIPO: Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore. 2002, points no. 9-12 on how. Available at http://www.wipo.int/edocs/mdocs/tk/en/wipo_grtkf_ic_3/wipo_grtkf_ic_3_7.doc. Visited 10-1-08
by a handful of people with special roles in the community, in the course of the history of that community it becomes essentially communally held knowledge. This is because those with the special knowledge do not “own” it as such, and many have obligations to share the knowledge within the community. There may exist, for instance, community standards for when the information must be passed, such as during initiation rituals. These features indicate slight but important differences between the meaning of individual property in Western culture, and knowledge held by individuals within a non-Western community context.”

There is thus very little distinction between knowledge of communities and of individuals within communities in the realm of TIK. In most cases of traditional and indigenous communities, a strong sharing ethos prevails, leading to the rejection of any form of individualistic Western style appropriation as recognized and rewarded by the IPR regime.

Ownership patterns of traditional knowledges prevent rights claims over it within any framework of individualized rights such as the TRIPS. A recent study by two political philosophers, Anthony Stenson and Tim Gray, argues that because traditional knowledge is primarily common knowledge, the product of collective experience, without a single act of creation, it gets precluded from being seen, from the point of entitlement theory, as intellectual property. The entire idiom of western legal practices and the vocabulary of Intellectual property protection law carves out exclusive rights to an individual (either a natural person or a legal one) to exploit particular creations of human ingenuity. For example, a patent vests exclusive right in an inventor to develop, control, use and market an innovative industrial process or product for a specified period of time. Trademarks extend protection to brand names that have a particular identity in the marketplace, while trade secrets protect confidential information often of commercial value to an industrial firm or person. Copyright covers literal and artistic works such as computer software, writings and drawings. Generally, these forms of intellectual property protection do not provide the necessary protection for traditional knowledge, innovations and rights of indigenous and local peoples. One of the prime reasons is that the locus of ownership cannot be determined for knowledge systems that are essentially inter-generational and a product of communal endeavour.

45 An exception is copyright law that accords a certain measure of protection for recorded or documented traditional knowledge. In Canada and Australia, copyright protection has been used by Aboriginal artists,
A necessary criterion that intellectual property must meet is that it must be considered non-obvious or 'novel'. Indigenous knowledge often falls short of this requirement as traditional knowledge is often orally transmitted, evolves gradually, and has no novelty requirement. Also, unless a product is substantially different from one found in nature, and is thus the result of a "non-obvious" human invention, the product is considered unpatentable. Any substantial alteration from a normal/natural state makes a product "non-obvious". However, what constitutes such an alteration is a complicated question. For example, in many indigenous communities, shamanic knowledge or medicinal products are believed to come from natural or supernatural sources as opposed to being "man-made" or "invented". In some Indian medical practices, certain medical potions acquire their potent properties only when they are blessed by the gods, again denoting a blur in the conception of what is man-made. The extent of what constitutes natural and what, man-made differs from culture to culture indicating a difficulty in determining what should be considered an "innovation" (a product of human intervention and conceptualization) or simply a product of nature.

A third feature which prevents TK or indigenous knowledge from being regarded as intellectual property is the element of disclosure. Some traditional knowledges, especially in China and India have, through history become disclosed as a result of codification (that is, formalization in written form), wide use, or through collection and publication by anthropologists, historians, botanists or other researchers and observers. When TK/IK is disclosed it becomes publicly available and, hence, under current IPR rules, this knowledge cannot be appropriated, either by its traditional holders or third parties. Kept in public access, these forms of knowledge acquire properties of public goods. Much indigenous knowledge is not traceable to a specific community or geographical area and is often classified as falling within the "public domain". The "public domain" in intellectual property law consists of intangible over which exclusive intellectual property rights cannot be claimed and which therefore become freely available to be used and exploited by any person. It is significant to note that the notion of the "public domain" has been composers and writers of tradition-based creations. However, it is relatively expensive for holders of traditional knowledge to enforce their intellectual rights enshrined in copyright. It is important to also note that copyrights protect an expression and not necessarily the knowledge in that expression. A growing public policy debate is now whether traditional knowledge should be protected under other forms of intellectual property law, particularly patent law.

used to serve as a tool to not only deny the claims of TK/IK for intellectual property protection but also as a tool by the bio-prospecting corporations to legitimize the free appropriation of what has come to regarded as the “global commons”.

On the other hand if forms of IK knowledge are undisclosed as, for instance, amongst Kenyan traditional medical practitioners and remain non-codified, they get termed as “folk”, “rural”, “tribal” and “indigenous”, based on traditional beliefs, norms and practices, on centuries old experiences of trials and errors, and therefore cannot be classified as innovation or scientific and will not lend themselves to proprietalization. They also, it is alleged, exist in a ‘non-commercial form, valid and appropriate for the people and geographical context in question. Thus in order to improve their accessibility and wider applicability, they need to be repackaged in the language and form of a ‘product’, that can have a wider, perhaps universal, accessibility. TK/IK can, it is alleged, provide some useful leads or cues, “sign posts” for the screening of natural products for therapeutic benefit. It may also be useful to confirm research results produced in the laboratory and complement scientific testing, including safety and efficacy. But in itself it does not exist in a form that can be accorded the status of intellectual property, which is reserved for those innovative ventures that yield results and products that the market and global users can understand; in other words innovations that yield results couched in the language of modern science.

A final barrier for IK to become eligible for intellectual property protection is the prohibitive costs of registering and defending a patent or other intellectual property right effectively limits its availability to the vast majority of indigenous communities, primarily in developing countries. Aside from the costs involved, most of the carriers of TK are well outside the domain

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49 Vandana Shiva, a vehement critic of the implications of global commons, argues that even though references are made to ‘global biodiversity’ and ‘global genetic resources’ biodiversity is not a global commons in the ecological sense in which atmosphere or oceans are. Biodiversity more has the character of a ‘local commons’ around which communities subsist and in turn sustain the ecology that sustains them. She adds that a resource is common property when social systems exist to use it on principles of justice and sustainability. For details see, V. Shiva, “Biodiversity Conservation, People’s knowledge and Intellectual Property Rights,” in Biodiversity Conservation: Whose Resources? Whose Knowledge? Ed. Vandana Shiva (Delhi: INTACH, 1994), 4-6

50 A significant part of traditional medicine in remains secrets. Knowledge held by bone-setters, midwives or traditional birth attendants and herbalists, including knowledge of healing techniques and properties of plants and animal substances, access is restricted to certain classes of people. For some instances of such knowledge in Africa see, Nyamwaya David, African Indigenous Medicine (Nairobi: KEMRI, 1992); J.O. Kokwaro, Medicinal plants of East Africa (East African literature Bureau, 1993). Quoted from Kibet A. Ng’etich, Indigenous Knowledge, Alternative Medicine and Intellectual Property Rights Concerns in Kenya, 2005.
and the levels of legal awareness required. Most of these societies are not "legal" societies that can easily access the legality of intellectual property laws.

These barriers have kept the traditional/indigenous societies outside the 'loop' of the intellectual property rights protection. Modern day intellectual property law allows control over knowledge if certain socially, economically and culturally determined conditions are met. A claim to legal control over knowledge will normally fail, as it does in most cases of traditional or indigenous knowledge, if there is no external manifestation or precise delineation, no identifiable author or inventor, no novelty or originality. Indigenous knowledge often falls short of these requirements.

There are a number of questions which emerge: Can TK/IK legitimately claim the status of Intellectual property rights, much in the same way as western innovations do? Or is the legitimacy of its claim limited to the agreed upon criteria? Do the criteria reflect an intellectual and cultural bias? Does TK need to be validated according to the western intellectual property norms in order for its legal status to be formalized? There are ongoing debates as regards the alternative mechanisms according to which their contribution can be rewarded, validated and legalized.51 From the perspective of this chapter, the main objective is to demonstrate the uneasy fit between two diverse knowledge systems – systems so diverse that at the technical and legal level one threatens to encroach, remodel and subsume the 'other' i.e. TK/IK, in terms of western scientific validation principles. Is it then a matter of amending and fine-tuning the intellectual property laws in order to make them more responsive to dimensions of TK/IK, or is a matter of re-conceptualizing the very notion of knowledge/intellect as property?

This chapter seeks to establish that the very notion of intellectual property is a notion that is alien to the intellectual traditions of indigenous or traditional peoples and that any attempt to incorporate the knowledge rights of the traditional peoples within the terms of TRIPS, even if reformed, is likely to result in the rewriting the history of TIK in terms Western hegemonic intellectual and cultural traditions. As a delegate at Round Table Sydney stated: "One should not attempt to amend Western laws to cater for indigenous peoples. Attempts to do so will be doomed, because the IP system and the needs of indigenous peoples are too distinct."52 Claims of indigenous knowledge holders are based on completely different cultural norms. The

subsumption of diverse knowledge systems under one uniform intellectual property regime has raised issues about intellectual property rights being a specific instance of a larger claim for intellectual and cultural domination.

Demonstrating the epistemic and cultural hierarchies embedded in the notion and practice of IPRs is politics of Neem. Neem, a symbol of indigenous knowledge, provides a useful resource for symbolic politics of knowledge. Politics over neem demonstrates the extent to which TIK is attempted to be framed in and structured in accordance with the principles of modern science. It symbolizes the appropriation of traditional knowledge as intellectual property; it symbolizes the infringement of knowledge rights of the traditional and indigenous communities.

**NEEM: A CASE STUDY IN KNOWLEDGE RIGHTS INFRINGEMENT**

**The Significance of Neem**

Neem (*Azadirachta indica*), labelled as the 'the wonder tree' is perhaps the most celebrated medicinal plant of India and finds mention in a number of Puranic texts as also in ancient Persian and Urdu pharmacopeias who called it a 'Blessed Tree' and the 'Village Pharmacy'. Parts of the tree provide effective ingredients for traditional and modern toothpastes, medicines, cosmetics and insect repellents. *Neem*, also called Holy Tree, is native to India and Sri Lanka and India alone has more than 20 million trees.

The past five decades have witnessed intensive investigation and growing scientific interest in neem and its diverse properties resulting in large number of research publications, books and conferences at national and international levels. In India, attempts in research and development of neem began as early as the 1960s. It led to isolation and identification of hundreds of the active compounds, from various parts with pesticidal, fungicidal, bactericidal, anti inflammatory, anti-tumor and other properties and found its applications in pesticide, medical, healthcare and cosmetic industry all over the world. Worldwide attention based on evaluation and realization of the long-term benefits that neem promises have resulted in a surge of commercial interest. The potential for industrial applications has, in part, triggered feverish research on the understanding of neem chemistry.

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53 For an exhaustive list of the research institutions and scientists involved in Neem research refer Vandana Shiva, Radha Holla Bhar, K. Vijayalakshmi and K.S. Radha, *Neem* (Delhi: RFSTE, 2006), 28-30
The Sanskrit name, *Nimba*, meaning to bestow health, suggests the many therapeutic values of the tree and its various parts. *Over 700 herbal preparations based on neem are found in Ayurveda, Siddha, Unani, Amchi and other local health traditions.* P. Pushpangadan pointed out that over 160 local practices are known in different parts of the country where neem forms an important or sole ingredient in curing human ailments or disorders. What is of significance in the context of the chapter is the evidence provided at the World neem Conference on the extent to which the *knowledge about neem lies in the public domain in India*. Knowledge residing in the public domain essentially prevents it from being patented, at least in India, for the products and the processes to derive the products would neither be ‘novel’ nor ‘non-obvious’. However, this has not prevented attempts to patent neem in other countries such as Japan and the US. In cases where the patenting of traditional knowledge is prohibited in the source country such as in India, there is therefore a possibility that a product or a process could be patented in the jurisdiction of another country. The story of Neem explicates this issue clearly.

**Neem Patents**

Neem has been patented widely. (Annexure 8, 9, 10) There have been numerous instances of challenges to Neem patents which have been successful in revoking the patents but a number of neem patents still exist. Since the 1980s, many neem related processes and products have been patented in Japan, USA and European countries. The first US patent was obtained by Terumo Corporation in 1983 for its therapeutic preparation from neem bark. In 1985 Robert Larson, a US timber importer, obtained a patent for his preparation of neem seed extract and the Environmental Protection Agency (EPA) approved this product for use in US market. In 1988 Robert Larson sold the patent on an extraction process to the US Company W.R. Grace (presently Certis). Having gathered their patents and clearance from the EPA, four years later, Grace commercialized its product by setting up a manufacturing plant in collaboration with P.J. Margo Pvt. Ltd in India and continued to file patents from their own research base in USA and other parts of world. In 1992, the US Patent and Trademark Office (USPTO) issued a patent to WR Grace which covered a method of creating a stabilized azadirachtin (active pesticidal ingredient

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54 Fourth World Neem Conference 2002 was held at Mumbai. Issues covered were environment and socioeconomic, animal and human health, chemistry, nematode control, fungus control, processing and product development, genetic improvement and afforestation. A report on "Neem 2002: World Neem Conference" held in Mumbai from 27 to 30 November 2002 and organized by Neem Foundation, Mumbai.

55 US Patent No. 4,515,785 (Neem Bark Extracts); US Patent No. 4,537,774 (Hot-water Extracts of Neem) Granted to Terumo Corporation (Japanese Corporation) in 1983
found in Neem tree extracts) in solution and the stabilized azadirachtin solution itself.\textsuperscript{56} Subsequently, the US. EPA registered Grace’s stabilized azadirachtin solution for use on food crops under the name \textit{Neemix}—

Aside from Grace, neem based pesticides were also marketed by another company, AgriDyne Technologies Inc., USA.\textsuperscript{57} US Patent No. 5,009,886 was granted in 1993 to Floss Products Corp., Illinois, for the development of a toothpaste using Neem roots and branches (using Neem twigs to clean teeth is a practice followed by large parts of the Indian community over millennia). It also covers the paste compound and the process of deriving micro-fibres from the branches and roots to include in the paste. “The use of Neem as a dentifrice is neither ‘novel’ nor ‘different’. The paste is nothing more than a minor modification of traditional use and this minor modification is based on the traditional knowledge of the use of neem fibres as a dentifrice. Besides neem has been commercialized in India since the 1960s, neem based toothpaste being produced by both the cottage sector as well as by the domestic industry, argues Shiva. Prior commercialization of product and common knowledge are two criteria which establish the fact that particular knowledges lie in the public domain and are therefore constitute evidence of ‘prior art’ or prior knowledge which should be sufficient to defeat patent claims.

The 10-year period from 1985 to April 25, 1995 was marked by a deluge of US and European patents on neem-related products. Some 28 patents were filed in that period in USA (of which 15 were filed in just the 16 months between January1994 and April 1995 - almost at the rate of one every month), 16 European and 9 PCT patents – a total of 53 patents,\textsuperscript{58} all claiming to be ‘new inventions’ however nearly all related to the dentifrical and pesticidal/fungicidal properties of neem, known and utilized in India for centuries. As on March 2005, sixty-five patents for products derived from the Neem tree have been filed with the European Patent Office (EPO) to date, of which 22 have been granted, 28 are “dead” for various reasons, and 9 are currently being examined.\textsuperscript{59} These include claims for insecticides, fungicidal effects, methods of extraction, storage stable formulations of one of the active ingredients, azadirachtin, contraceptives, and

\textsuperscript{56} US Patent No 5,124,349, Storage Stable Azadirachtin Formulation (issued 23 June 1992)
\textsuperscript{57} AgriDyne had established a joint venture with \textit{Aftaab Investment Co. Ltd} of the Tata Group of India to manufacture and sell plant based bio-pesticides on the Indian market. For agricultural pesticides, the annual estimated value of the Indian market is US$ 495 million, the 13th largest in the world. Kocken, J. and Roozendaal, G. Van \textit{“The Neem Tree Debate.” Biotechnology and Development Monitor,} No. 30 ((1997): 811.
\textsuperscript{58} Reported in \textit{Down to Earth,} Vol 4, NO 20 (March 15, 1996)
\textsuperscript{59} V. Shiva et al, \textit{Neem,} (2006), 174
\textsuperscript{59} A Report on ‘Neem’. World Neem Conference’ 2002:

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medical uses. It is important to note that the Neem patents do not involve a genetically engineered product; neither has the tree itself been patented, nor any of its parts.

Who are the patentees? As per the Neem Foundation data, the largest number of patents is in USA (54) followed by Japan (35), Australia (23), India (14). With corporations holding nearly three-fourths of all patents on neem-related products, research institutions take a distant second place with six patents or 17 per cent of all patents; individuals have four patents or 11% of all patents. One particularly intriguing European patent (patent no 436257 dated July 10, 1991), titled Hydrophobic extracted neem oil—a novel insecticide and fungicide is held jointly by W R Grace and Co and the US government. Although some Indian companies have claimed patents on the Neem, they are outnumbered 2 to 1 by multinational corporations, such as the U.S. pharmaceutical company Rohm and Haas and the infamous agrochemical giant W.R. Grace.

An analysis of type of patents suggests that majority of them are for crop protection applications (63%), followed by health care (13%), industrial (5%), veterinary care (5%), cosmetics (6%) and others (8%). This trend is also seen in country-wise granted patents. For example, in the US, out of 54 neem patents granted, 31 were for crop protection, and the rest for healthcare, cosmetics, industrial and veterinary applications. Patents ownership by organization indicates that the largest number owned by Certis—W. R. Grace (49) followed by Rohm & Haas (36), CSIR-India (14), Trifolio (9), Bayer (8) and EID Parry (6).

The two patents, (1) US Patent No 5,124,349 for ‘Storage Stable Azadirachtin Formulation’ issued on 23 June 1992 and (2) European patent (patent no 436257 dated July 10, 1991) are significant cases because on them converged the symbolic fight against appropriation of traditional knowledge (has come to be referred as biopiracy) made possible by the TRIPS laws. These two cases also came to signify the protest against the epistemic and cultural superiority engendered by the TRIPS regime. They became the focal point of the assertion of the right of the traditional indigenous peoples over their knowledge rights and their resources. The patent battles

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For examples of some patents see Annexure 8

61 For instance, an Indian company Godrej Soaps Ltd (Bombay) has also received a US patent on a neem fatty oil distillation residue based pesticide

came to question the conceptual and moral premises of intellectual property rights which assert the primacy of one kind of knowledge right over another.


The patent (patent no 436257 dated July 10, 1991) had been filed by United States Department of Agriculture (USDA) and W.R. Grace on December 12, 1990 at the European Patent Office (EPO). On 14 September, 1994, the EPO granted a patent for a particular method for controlling fungi on plants which comprised contacting the fungi with a neem oil formulation and the process for obtaining Neem oil (hydrophobic extracted neem oil). This pesticide was alleged to have the ability to repel insects from plant surfaces, prevent fungal growth, and kill insects and fungal pests at various life stages. The grant of a European patent for this application was published on September 14, 1994, the main claim having been restricted by the EPO to: "A method for controlling fungi on plants comprising contacting the fungi with a neem oil formulation containing 0.1 to 10% of a hydrophobic extracted neem oil which is substantially free of azadirachtin, 0.005 to 5.0% of emulsifying surfactant, and 0 to 99% water."

W R Grace had been granted the patent to develop a fungicide from neem seeds but it was widely and vehemently opposed by many people, in India and beyond, who regarded it as an attempt to patent what had always been common property. A patent challenge was filed on June 5, 1995, Vandana Shiva of Research Foundation for Science, Technology and Ecology (India), Linda Bullard of International Federation of Organic Agriculture Movements (Germany) and Magda Alvoet, Health and Environment Minister of Belgium. Patents are exclusive rights given for inventions to make, sell and distribute a patented product or products made through patented processes. An invention needs to be novel and non-obvious, that is, there should be no evidence...
of prior art and also that the invented product should be radically different in its formulation than the existing ones in the field. This was not the case with the neem patent. A legal opposition was filed by the three opponents on grounds that the fungicidal effect of hydrophobic extracts of neem seeds was known and used for centuries on a broad scale in India, both in Ayurvedic medicine to cure dermatological diseases, and in traditional Indian agricultural practice to protect crops from being destroyed by fungal infections. The Opponents claimed that the fungicidal effect of hydrophobic extracts of neem seeds was known and used for centuries on a broad scale in India, both in Ayurvedic medicine to cure dermatological diseases, and in traditional Indian agricultural practice to protect crops from being destroyed by fungal infections. Since this traditional Indian knowledge was in fact ubiquitous in Indian culture from ancient times, they asserted that the patent in question lacked two basic statutory requirements for the grant of a European patent, namely “novelty” (Article 54 of the European Patent Convention [EPC] and “inventive step” (EPC Article 56, in the U.S. called non-obviousness).

In addition, the Opponents charged that the patent was contrary to “morality,” Article 53 (a) of the EPC, because the so-called inventors claimed monopoly property rights on a method which forms part of the traditional knowledge base of India—in essence stealing it—and theft is regarded as immoral in European culture. Finally, they cited the formal grounds of “insufficient disclosure” (EPC Article 83) and “lack of clarity” (EPC Article 84) in calling for the revocation of the patent. Subsequently, the Opponents requested an additional ground for opposition, namely that the patent constituted de facto a monopoly on a single plant variety, which is barred by Article 53 (b) of the EPC. 65 On these grounds the opponents “challenged Patent 0436257 B1 to establish that this patent, like others based on biopiracy, was nothing novel and did not involve an inventive step” 66

Two expert witnesses from India were made to testify from the opposition bench: Dr. Uday Pratap Singh of Varanasi (Professor and Head Department of Mycology and Plant Pathology, Institute of Agricultural Sciences, Banaras Hindu University), widely regarded as India’s greatest expert on Neem from the scientific community, and Mr. Abhay Dattaray Phadke of Pune (Managing Director of Ajay Bio-Tech (India) Ltd.), an agronomist who had commercialized a neem product in India (without claiming patent protection). On the basis of testimony presented, the Opposition Division of the EPO ruled that the patentee’s claim of novelty had been destroyed

65 Linda Bullard, Freeing the Free Tree (2005)
66 V.Shiva, Campaign against Biopiracy (New Delhi: RFSTE, November 1999)
on the basis of clearly demonstrated prior public use. Opposition Division ruled that even in amended form, the “invention” was lacking an inventive step. Thus, the patent was revoked in its entirety.

The Opposition Division of the EPO accepted the opponents’ argument that patents should not be granted for common traditional knowledge, but pointed out that this argument should be used for establishing “prior art” and is not a question of morality under EPC, as the opponents had charged (the patent was contrary to “morality,” Article 53 (a) of the EPC) It is important to note that the case was won on the basis of affidavits and testimony, and that intellectual achievements of traditional societies were recognized officially as a means to establish “prior use”. The Decision of the European Patent Office stated:67 “Moreover the opposition division agrees with the Opponents that no patents should be granted for anything which was known previously, for example as part of common traditional knowledge. However, under the EPC this is …a question of novelty or prior public use” (and not morality).68 The USA and W.R. Grace appealed to the next level within the European Patent Office (EPO), the Technical Appeals Board, demanding that the decision of the Opposition Division be overturned and submitting yet another modified formulation of their original claim.

Five more years of deadlines and submissions ensued before the case once again reached the level of an Oral Proceeding at the EPO.69 The five-member Technical Board of Appeals needed only two hours to reach its decision. On March 8 2005, significantly Women’s Day (the three opponents were women) the Chairman announced, “The Appeal is dismissed. The patent is revoked.” The reasoning of the Opposition Division was upheld, that the patent did not satisfy the requirements for novelty and/or inventive step. EPO struck down Patent No. 436257, jointly held by the United States Government and the multinational W.R. Grace. The EPO upheld that this patent was based on the piracy of existing knowledge systems and lacked novelty and inventiveness. Vandana Shiva described the battle, collectively waged and successfully won, as “a major milestone... crossed in the contemporary movement of freedom from biocolonialism

68 Article 53(a) EPC: “Inventions the publication or exploitation of which would be contrary to “ordre public” or morality, provided that the exploitation shall not be deemed to be so contrary merely because it is prohibited by law or regulation in some or all of the Contracting States”. Available at http://www.epo.org/patents/law/legal-texts/html/epc/1973/e/contents.html . Visited 20-01-08
69 WR Grace in the meantime was acquired, along with its patents, by Certis, a wholly-owned subsidiary of the Japanese company Mitsui & Co., which is now one of the largest providers worldwide of “safe food” technologies. Throughout these business mutations, the United States of America has remained the constant “co-proprietor” of the patent.
and biopiracy." Linda Bullard, the other co-opponent wrote, "Legal history was made on March 8th, 2005 in Munich, Germany when the Technical Board of Appeals of the European Patent Office (EPO) revoked in its entirety a patent on a fungicide made from seeds of the Neem tree, concluding a ten-year battle in the world’s first legal challenge to a Biopiracy patent. In a press release on March 8th 2005, the Greens in the European Parliament cabled out to the world that the decision to uphold the revocation of a patent on the Indian Neem tree was "a killer blow to biopiracy in Europe and around the world".


Another contested Neem patent was the Grace US patent no. 5,124,349 which concerned a process to extract and stabilize an azadirachtin based pesticide (Margosan-O) from neem seed. In 1995, a coalition of 200 nongovernmental organizations from 40 countries was established to protest Grace's patent. In September of that year, the initiators of this coalition, Jeremy Rifkin of the Foundation on Economic Trends (USA) and Vandana Shiva, president of the Research Foundation for Science, Technology and Ecology (RFTSE, India), petitioned the US Patent and Trademark Office (PTO) to revoke Grace's patent. Other key petitioners included: Dr M D Nanjundaswamy of Karnataka Rajya Ryota Sangha, a farm organization representing farmers throughout India; Linda Bullard, Vice-President of the International Federation of Organic Agriculture Movements in Brussels; and Martin Khor, Director of the Third World Network.

Once again the opposition was based on grounds that the patent was derived from knowledge and use that lay in the public domain. Rifkin argued that the patent gives Grace exclusive rights to formulations, which have been developed and used by Indian farmers for centuries.

The central issue of the patent opposition was that the pesticidal extract in question has long been known to and used by the Indian people for protecting their crops. The knowledge of this was therefore available at the time of patenting, to any ordinary person and the difference between it and the patented product, if any, was 'obvious'. This challenge was seen as a critical test of the intellectual property laws established by the GATT agreement and the World Trade Organization.

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70 Vandana Shiva, Free Tree, *The Hindustan Times*, India. June 9, 2000
72 "EPO upholds decision to withdraw 'free tree' patent: Greens celebrate Neem biopiracy victory", available at: [http://www.greens.org](http://www.greens.org)
(WTO). As transnationals and other enterprises from the North scout remote regions of the South for genetic resources to patent, a process now referred to as bio-prospecting, 'the battle between native peoples and multinationals is, in the words of Jeremy Rifkin, "likely to be the critical to the North-South political and economic issue of the coming decade". In what was seen as the opening round in this confrontation, the neem tree became the symbol of resistance against appropriation of knowledge and resources from the global commons.

The pivot of W R Grace's justification for patents, therefore, was the claim that these modernized extraction processes constitute a genuine innovation: "Although traditional knowledge inspired the research and development that led to these patented compositions and processes, they were considered sufficiently novel and different from the original product of nature and the traditional method of use to be patentable." Azadirachtin, which was being destroyed during conventional processing of Neem Oil/Neem Cake is being additionally extracted in the form of water soluble neem extract and hence it is an add-on rather than a substitute to the current neem industry in India.

Attacking the claims of novelty Vandana Shiva asserted that the theory that azadirachtin was being destroyed during traditional processing is inaccurate. The extracts were subject to degradation, but this was not a problem because the product is used within a few days of production. Therefore there was no immediate need for a process of stabilizing the extract. The need for extract preservation only arises in case of mass production for broader and distant export markets. Moreover she added that stabilization techniques had already been developed by Indian scientists in the 1960s and 1970s. Dr R P Singh of the Indian Agricultural Research Institute asserts: Margosan-O is a simple ethanolic extract of neem seed kernel. The biologically active polar chemicals can be extracted using technology already available to villages in developing countries, stated Eugene Schulz, chair of the NRC (National research Council, US) panel. Villagers smash 'em [the seeds] up, soak [them] in cold water overnight, scoop the emulsion off the top and throw it on the crops.'

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74 Quoted from TWN website http://www.twnside.org.sg/title/neem-ch.htm
75 The ingredient that determines the efficiency of the pesticide is Azadirachtin. For unknown reasons, however, the content of a seed can vary significantly. In addition, if the seeds are not dried and stored properly, it can lead to an easy degradation of Azadirachtin.
76 Arvind Panagariya, The Myths and Realities of Neem-Based Patents. Times of India, January 16 1996
78 In the late sixties we discovered the potency of not only ethanolic extract, but also other extracts of neem ... Work on the neem as pesticide originated from this division as early as 1962. Extraction techniques were also developed by a couple of years. "The azadirachtin-rich dust was developed by me", writes Shiva. ibid
The central point is that the existing Neem patents apply only to methods of extracting the natural chemical in the form of a stable emulsion or solution, methods which are simply an extension of the traditional processes used for millennia for making neem-based products. The discovery of neem's pesticidal properties and of how to process it was by no means 'obvious', but evolved through extended systematic knowledge development in non-Western cultures. In comparison to this first non-obvious leap of knowledge, it is the subsequent minor derivatives that are 'obvious'.

Under Sections 301 and 302 of the US Patent Code, any individual may file a request for the re-examination of an existing patent if the requester believes 'prior art' would have a bearing on the patentability of any claim of the patent. Prior art includes knowledge that was available at the time of patenting to a person of ordinary skill in the art. An invention is not patentable if the differences between it and the prior art would have been obvious at the time of patenting. Patent No. 5,124,349 (W R Grace's patent) was demanded to be revoked because the company's method of extracting stable compounds was widely used prior to the patent's issuance and because the extraction methods had been previously described in printed publications. In fact, common knowledge and common use of neem was one of the primary reasons given by the Indian Central Insecticide Board for not registering neem products under the Insecticides Act, 1968. The Board argued that neem materials had been in extensive use in India for various purposes since time immemorial, without any known deleterious effects.

The patents granted to W.R. Grace in Europe and the U.S. stirred up a lot of resentment in India and many felt that W.R. Grace had claimed as their own, knowledge which belonged to the people of India. The storage stable formulation was regarded as at best obvious and thus lacking any inventive step. A fear was that the traditional use in India would eventually be seen as patent infringement and the patent itself would drive the price of Neem seed up.

BIO-PIRACY: IMPLICATIONS FOR KNOWLEDGE RIGHTS

The Neem patents are just one in a large catalogue of genetic resources originating in the South over which intellectual property rights are being asserted by a few multinational corporations belonging largely to the North. The Neem Patent challenge was initiated in solidarity with the

79 Ibid
Neem Campaign of India, which was launched in 1993 by farmers in India who feared that their genetic resources and traditional knowledge were coming increasingly under foreign control through the legal mechanism of patents. The whole process can be likened to a modern form of "enclosure of the commons"—in this case, of course, it was not public land being privatized but rather public knowledge. The case study attempted to highlight the undisputed existence of prior knowledge and usage of Neem related products in India which presents before us a classic case of bio piracy by the transnational corporations. Neither the traditional extraction methods (farmers in India use neem as a pesticide), nor the modern methods developed by Indian scientists, were patented. The botanical and the commercial value of Neem both ensure that there is an ongoing process of not only attempts at commercialization, but also attempts to secure, by means of patents, monopoly profits. In India, over 70 patents have already been taken out by Western (mainly American) corporations from the neem tree whose wide-ranging medicinal and environmental properties have been used, at no cost, by indigenous people for over 4,000 years. Neem's properties ironically are being claimed by big businesses as patented inventions.

Neem presents a case of biopiracy replicated in many instances, the common feature being existence of prior knowledge which lies in the public domain of traditional and often poor societies. The protection of this domain becomes dependent on their governments or public institutions who alone have the legal and the financial wherewithal to challenge the infringing patent. Discussed below are some prominent cases which, though representative of the infringement of knowledge rights, are by no means exhaustive.

**Basmati:** In the year 2001-2002, India exported 850,000 tons of basmati (a variety of long grained aromatic rice) and earned Rs. 21.42 billion. This was the basis of the patent fight between India and the U.S. based company called Rice Tec Inc., in Alvin, Texas, which filed a patent in the US patent office for a product it had made and called Basmati. In late 1997, this company was granted a patent to call the aromatic rice grown outside India 'Basmati'. Rice Tec had been trying to enter the international Basmati market with brands like 'Kasmari' and 'Texmati' with minimal success. RiceTec Inc, was issued the Patent number 5663484 on Basmati rice lines and grains on September 2, 1997. With the patent rights, RiceTec would be able to not only call its aromatic rice Basmati within the U.S., but also label it as Basmati for its...
exports. This was likely to hit Indian exports of basmati badly. According to Dr Vandana Shiva, the "theft involved in the Basmati patent is threefold: a theft of collective intellectual and biodiversity heritage on Indian farmers, a theft from Indian traders and exporters whose markets are being stolen by RiceTec Inc., and finally a deception of consumers since RiceTec is using a stolen name Basmati for rice which are derived from Indian rice but not grown in India, and hence are not the same quality." 83

The Indian government put up a fight against the patent granted to Rice Tec., following which a U.S. court ruled that the company did invent new technologies and that the patent is valid. India then re-approached the issue as one of nomenclature and attempted to protect the name "Basmati" as a geographic indicator (GI). In other words, basmati is a term that should be restricted to the product from this geographic location, much as champagne produced in the U. S cannot be called so; it is termed "sparkling wine". Geographic indicators are a useful concept since they protect native wisdom, technologies and traditional efforts from being hijacked. Article 22-24 of the TRIPS agreement provides for the protection of GI's or prevention of this misuse. Under this, bio-resources traditionally nurtured by the local community inhabiting the particular region should be deemed as belonging to that region. After a prolonged legal battle, the patent was revoked in 2001. The Patent Examiner also changed the title of the patent from "Basmati Rice Lines and Grains" - covering a broad generic claim to invention of Basmati, to invention of Basmati to "Rice Lines Bas867, RT 1117, RT1121" which are restricted to the specific breeding done by RiceTec and not open-ended as the original patent was, which covered wide ranges of plant height, grain size, aromatic quality including the qualities of our traditional Basmati. The patent holder now cannot claim the unique qualities of our Basmati nor the unique name "Basmati". 84

Turmeric: Turmeric presents a similar case. Two researchers of Indian origin, based at the university of Mississippi Medical Center in Jackson applied for a US patent on the use of turmeric in wound healing. As per the conditions of patentability, 85 the 'prior art' clause is recognized if it is described in a ‘printed publication’. 86 In this case printed materials were

83 Quoted from Ted Case studies; Basmati. Available at http://www.american.edu/ted/basmati.htm
85 35 U.S.C. 102 Conditions for patentability; novelty and loss of right to patent
86 Ibid, See 35 U.S.C. 102 Clause (a)One way it can be proven that an invention is not novel or new, is to show evidence of prior art, or prior knowledge of the invention. In the United States proof of prior art would be prior knowledge, use or invention. However, prior foreign knowledge, use and invention are all excluded from proof of prior art, if a foreign nation such as India were to challenge the patent on grounds of novelty. For a foreign nation such as India to prove prior art they would need to come up with a printed publication, a document related
available but not presented. The patent was granted in 1995\textsuperscript{87} on the basis of limited searches for prior art which did not indicate that the claims were apart of public domain. Subsequently the patent was challenged by Council of Scientific and Industrial Research (CSIR) and the patent was revoked on the grounds that the alleged invention was actually a part of public domain knowledge in India.

The turmeric dispute again highlights the central issue of whether the use of turmeric in wound healing should have qualified as a patentable U.S. product - whether it meets the legal criteria of "Novelty, Non-Obviousness, and Utility" - and what India's rights should be with regard to trading the herb bilaterally. There are alleged weaknesses in U.S. patent law that discriminate against developing countries by failing to recognize products like turmeric as "non-novel," despite the fact that this medicinal plant and other traditional agro-chemicals have been used in healing for thousands of years.

**Ayahuasca:** Inspired by the turmeric case, the Coordinating Body of Indigenous Organizations of the Amazon Basin (COCIA), which represents more than 400 indigenous tribes in the Amazon region protested about a wrong patent (US Plant Patent No. 5,751 issued in 1986) given on a plant species native to the Amazon rainforest called B.Caapi and its traditional medicinal uses through an indigenous product called 'Ayahuasca'. The petitioner specifically cited the case of revocation of the turmeric patent fought by India and asked for similar justice. On re-examination, the patent was also revoked by USPTO in November 1999. Interestingly, although the patent was granted in 1986, the case was fought only in 1999, after the success of the turmeric case in 1997.\textsuperscript{88}

**Maca:** The patent row over the Peruvian Maca plant is another representative case in point which highlights the infringement of knowledge rights at a global level. For hundreds of years, Quechua Indians have grown 'maca', the frost-resistant root that thrives in these frigid Andean highlands, to boost stamina and sex drive. Riding the Viagra craze, two US companies patented extracts of a plant grown in the Andes that has long been used by indigenous people to promote sexual

\textsuperscript{87} US Patent No 5,401,504, Use of Turmeric in Wound Healing (issued 28 march 1995)
\textsuperscript{88} For details see Glenn M. Wiser, Center for International Environmental Law November 1999
http://www.ciel.org/Biodiversity/patorejection.html
function and fertility. An additional patent application is pending.\textsuperscript{89} Peruvian officials called the patent an "emblematic case" of biopiracy and are preparing to challenge it in U.S. courts.\textsuperscript{90} Attempts by Peruvian indigenous groups, meanwhile, ultimately failed to overturn U.S. patents based on ayahuasca, a hallucinogenic plant used for centuries in religious and healing ceremonies.

The Maca dispute exemplifies yet another collision between indigenous people and commercial interests over so-called biological prospecting, the growing practice of scouring the globe for exotic plants, microbes and other living things ripe for commercial exploitation. That has not stopped some of the world's poorest countries, which are also the richest pockets of natural biodiversity, from contesting patent claims based on their knowledge resources. India has had the most success, most recently persuading the European Patent Board of Appeals to invalidate a 1994 patent granted to U.S.-based W.R. Grace & Co. for an insecticide derived from neem seeds. Turmeric, Basmati being the two other publicized cases.

Neem, along with Maca, Turneric, Basmati, Ayahuasca, only exemplifies a typically stylized story of what has come to be referred to as bio-piracy. The stylized story is one where researchers learn of a traditional herbal remedy or food crop, perform a series of laboratory testings, do selective breeding to determine how a remedy works or how to produce it in an industrial setting, and then receive a patent on what is little more than the traditional product. Shiva, one of the earliest to have coined the term bio-piracy, defines it as a process by which "the biological and natural resources of communities and the country are freely taken, without recognition or permission, and are used to build global economies."\textsuperscript{91} The central criticism in the biopiracy literature is that the big corporations are freely appropriating bio-diversity and ethnobotanical resources and traditional knowledge bases of the people, generally by means of patents without compensation to the indigenous groups who originally developed such knowledge. Once IK is appropriated from unprotected commons, repackaged and made ‘scientifically tested’ and

\begin{footnotes}
\item[89] US Patent No. 6,267,995—Pure World Botanicals, Inc. Issued July 31, 2001 Extract of Lepidium meyenii roots for pharmaceutical applications. Applications pending in Australia, the European Patent Office, and at WIPO.


US Patent Application No. 878,141—Pure World Botanicals, Inc. Published April 11, 2002 Compositions and methods for their preparation from Lepidium


\end{footnotes}
'commercially accessible', the erstwhile IK, divested of its essential identity, is claimed as an innovation and then as intellectual property. This practice, commonly referred to as bio-piracy, is actually an unauthorized commercial use of biological resources and/or associated TIK from developing countries, or the patenting of 'inventions' based on such knowledge or resources without compensation. Critics of such practices argue that if patent, copyright and trademark infringements are acts of intellectual piracy, then so is the failure to recognize and compensate the intellectual contributions of traditional peoples and communities who are the primary innovators.

The appropriated knowledge is used for claiming intellectual property rights such as patents and trademarks even though the primary innovation and creativity had not taken place through corporate investment. Bio-piracy and patenting of indigenous knowledge is a double theft, argues Shiva, because first it allows theft of creativity and innovation; and secondly, the exclusive rights established by patents on stolen knowledge steal economic options of everyday survival on the basis of our indigenous biodiversity and indigenous knowledge. Biopiracy thus means not only the smuggling of diverse forms of flora and fauna, but mainly the appropriation and monopolization of traditional population's knowledge and biological resources. It results in the loss of control of traditional populations over their resources and can have implications for their livelihood and food security.

Appropriation of traditional knowledge is facilitated by the fact that this knowledge is communally held, feely exchangeable and in the public domain. According to the stipulations of the patent laws that govern TRIPS and other patent laws in the West, this ought to constitute "prior art" "prior use" or "prior Knowledge ". But in most of the developed nations like United States, "prior existing knowledge" is only recognized if it is published in a journal or is available on a database - not if it has been passed down through generations of oral and folk traditions. This raises important questions about the vulnerability of traditional knowledge to patenting in non-source countries. In the turmeric and the neem cases, there two things that resulted in the revoking of the patent: one was the presence of printed material which was later presented as proof of 'prior art' and the second was the intervention by CSIR. What was in its favour was that it had to undertake the challenge in a single country. The problems multiply exponentially when the challenge has to undertaken by an individual in multiple countries. The problem of challenging patents reaches a dead end if there is no printed material available which documents the presence of the knowledge in the public domain. There are more instances of TIK residing in
oral traditions than documented texts. These then become doubly vulnerable as they cannot furnish proof required for establishing prior use/art.

The irony here is that India has suffered even though its traditional knowledge, as in China, has been documented extensively. But the documentation is available in languages which are not found to be easily accessible to international users. For instance, ayurvedic texts are in Sanskrit and Hindi, unani texts are in Arabic and Persian and siddha material is in Tamil language. Patent examiners, in the international patent offices, when considering the patentability of any claimed subject matter, use available resources for searching the novelty and appropriateness of the patent in question. Patent literature, however, is usually wholly contained in several distinctive databases and does not access prior art that may be buried somewhere in the many and diverse sources of non-patent literature.

Volumes of documentation reveal the extent to which commercialized patented products, a very large proportion of them being pharmaceuticals, stem from the traditional use patterns and knowledge bases of the traditional communities which ought to have been recognized as evidence of prior use in order to contest novelty or non-obviousness claims for patents. Examples abound. A few of them have been cited here to highlight the extent to which these knowledge systems underlie a lot of research and innovative activity taking place in the west.

Table - I shows some indigenous plants forming a part of the Indian traditional knowledge over centuries, which have been claimed as novel and patented

<table>
<thead>
<tr>
<th>Common name</th>
<th>Botanical name</th>
<th>US Patent no.</th>
<th>Patente</th>
<th>Purpose</th>
</tr>
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<tbody>
<tr>
<td>Kumari</td>
<td>Aloe barbadensis</td>
<td>5652265</td>
<td>Michael Collins</td>
<td>Medicine</td>
</tr>
<tr>
<td>Amaltas</td>
<td>Cassia fistula</td>
<td>5411733</td>
<td>Toyoharu, Japan</td>
<td>Antiviral</td>
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<tr>
<td>Kala Jeera</td>
<td>Cuminum cyminum</td>
<td>5653981</td>
<td>Hilton, USA</td>
<td>Activates immune system</td>
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<tr>
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<td>Punica granatum</td>
<td>5411733</td>
<td>Toyoharu, Japan</td>
<td>Antiviral agent</td>
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<tr>
<td>Harad</td>
<td>Terminalia chebula</td>
<td>5529778</td>
<td>Surendra Rastogi, India</td>
<td>Ayurvedic importance</td>
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<tr>
<td>Aswagandha</td>
<td>Withania somnifera</td>
<td>5466452</td>
<td>Whittle, USA</td>
<td>Skin disorder</td>
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<tr>
<td>COMPANY</td>
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<tr>
<td>-------------------------------</td>
<td>------------------------------------------------</td>
<td>-----------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W. R. Grace</td>
<td>[4556562][4946681][5124349] [5001146][5405612][5409708] [5411736][5397571]</td>
<td>Neem (Hindi); Margosa Tree (Eng.) Azadirachta indica</td>
<td></td>
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<tr>
<td>1750 Clint Moore Road</td>
<td></td>
<td></td>
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<td>Boca Raton, Florida, U.S.A.</td>
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<td>RiceTec Inc.</td>
<td>[5663484]</td>
<td>Basmati (Hindi &amp; Eng.); Oryza sativa</td>
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<td>Schloss Vaduz FL-9490</td>
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<td>Vaduz Liechtenstein</td>
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<td>Sabinsa Corporation</td>
<td>[5536506]</td>
<td>Kali Marich (Hindi); Black Pepper (Eng.); Piper nigrum</td>
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<td>121 Ethel Road West, Unit # 6</td>
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<td>Piscataway, NJ 08854, USA</td>
<td></td>
<td></td>
<td></td>
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<td>[5510255][547991][5494790][5538868] [5475099] [5576428] [5558834]</td>
<td>Erand (Hindi); Castor (Eng.) Ricinus communis</td>
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<tr>
<td>800 North Lindbergh Boulevard St Louis, Missouri 63167, U.S.A</td>
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<tr>
<td>Calgene(Subsidiary of Monsanto Co)</td>
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<td>Sarson (Hindi); Mustard (Eng.) Brassica compestris</td>
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<td></td>
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<tr>
<td>800 North Lindbergh Boulevard St Louis, Missouri 63167, U.S.A</td>
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<tr>
<td>Pioneer Hi-bred / DuPont</td>
<td>[5638637][5625130][5470359]</td>
<td>Sarson (Hindi); Mustard (Eng.) Brassica compestris</td>
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</tr>
<tr>
<td>International Inc., Des Moines, IA, USA</td>
<td></td>
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</tr>
</tbody>
</table>

Table 1 and Table 2 indicate appropriation of TK includes patents on uses of Indian medicinal plants such as Kumari (Aloe Barbadensis), Shallaki (Boswellia serrato), Amaltas (Cassia fistula), Kala Jeera (Cuminum cyminum), Dudhi (Euphorbia Hirta), Garden Balsam (Impatiens balsamina), Jangli Erand (Jatropha curcas), Indian Mustard (Brassica compestris), Pomegranate (Punica granatum), Kali Marich (Piper nigrum), Bhu Amla (hyllanthus niruri), Rangoon Creeper (Quisqualis indica), Arand (Ricinus communis), Black Nightshad (Solanum nigrum), Arjun (Terminalis arjuna), Harad (Terminalia chebula), Guruchi (Tinospora cordifolia), Aswagandha (Withania somnifera), Karela (Momordica charantia), Vilayeti Shisham (Sapium sebiferum), Chhotagokhuru (Tribulus terrestris), Ritha (Sapindus mukorossi), Ber (Zizyphus jujuba), Adaraka (Zingiber officinale), Latjira (Achyranthes aspera), Dhaya (Woodfordia florigunda), Kathal (Artocarpus integrifolia).  

The US patents office had already granted 14 patents on mustard, seven on castor, four on *amla*, three each for cassia, and *kumari* and two for bitter gourd, black cumin, jatropha and black nightshade for their various properties, says the report by Afsar H Jafri, deputy director of RFSTE. The report lists 22 medicinal and agricultural plants, including *ritha*, *amaltas*, *kumari*, pomegranate, balsam and Rangoon creeper that have been patented in America and Europe. The US tops the list with the maximum number of patents for Indian plants, followed by Japan, Canada, France, Germany and the UK, says Jafri. Other plants patented by these countries include *arjun*, *harad*, *jangli*, *guruchi*, *vilayeti shisham* and *chottagokhuru*.

There is, therefore, no longer the dispute that TIK has no commercial value. The literature is replete with examples of the commercial value of ethnobotanical knowledge. It is not just indigenous flora and plant varieties that have been 'pirated' but traditional knowledge as well which have become the basis for new generation drugs, herbicides, cosmetics etc.  

- “Studies have shown that as many as 74 percent of the plant derived human drugs are used for the same purpose for which native people discovered their use” (Society for Research and Initiatives for Sustainable Technologies and Institutions [SRISTI]).

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93 Ibid; Also see Afsar H. Jafri, *People’s Commission on Biodiversity, Indigenous Knowledge and People’s Rights: A Report* (New Delhi: RFSTE)  
95 "*Patents on Neem.*" SRISTI (Society for Research and Initiatives for Sustainable Technologies and Institutions). Available at http://esr.colorado.edu/sristi/papers/patentonneem.html.
• At least 7,000 medical compounds used in Western medicine are derived from plants. The value of developing-country germplasm to the pharmaceutical industry in the early 1990s was estimated to be at least $32,000 million per year. Yet developing countries were paid only a fraction of this amount for the raw materials and knowledge they contribute" (Rural Advancement Foundation International [RAFI] 1994). 96

• The value of the original plant matter is far less than that of retail prescription drug sales. U.S. imports of Indian medicinal and cosmetic plants equaled US$37.8 million in 2001, one-quarter of total U.S. imports. 97

• For example, 25 percent of US prescription drugs are said to have active ingredients from Indian plants. The sale of these drugs amounted to $4.2 billion in 1980 and $15.5 billion in 1990. In the EU, Australia, Canada, and the US, the market value for both prescription and over-the-counter drugs based on Indian plants amounts to $70 billion. 98 "The pharmaceutical TNCs of the North have thus appropriated colossal wealth from collection of tropical biodiversity which is expected to reach an amount of $47 billion by the year 2000" (The Statesman 1998).

• Dr Vinod Kumar Gupta, who is leading the traditional wealth encyclopedia project and heads India's National Institute of Science Communication and Information Resources (Niscair), reckons that of the nearly 5,000 patents given out by the US Patent Office on various medical plants by the year 2000, some 80% were plants of Indian origin. Also, some 42% of the people living in the US and 70% of the people living in Canada have used traditional medicines at least once for treatment. By one estimate, a quarter of the new drugs produced in the US are plant-based. 99

The resurgence of interest in traditional knowledge has ensured that IK is increasingly becoming the 'technical lead' in biodiversity prospecting. A number of pharmaceutical companies, for example Shaman Pharmaceuticals, rely extensively (and some exclusively) on traditional knowledge of indigenous and local peoples in their screening activities. There is no dearth of evidence, some of which have been presented, that traditional knowledge has immense therapeutic and commercial value. At the centre of debate and controversy is no longer the commercial or the scientific benefits of the traditional resources and knowledge; the issue is that of sovereign rights that ought to accrue to the holders and preservers of these resources.

The controversy over who has the rights to the neem tree, or turmeric or maca, raises a larger question: who has the sovereign rights over resources that are part of the global commons - the community that has been its caretaker and user for millennia or the individual/corporation which has appropriated it and legally ensured its ownership through various forms of intellectual property rights? The temporal dimension is not the only reason why the indigenous and traditional communities’ knowledge and sovereign rights over their genetic resources ought to be legitimized and institutionalized beyond the framework of evolving ‘benefit sharing mechanisms’. It is important to stress that the rights of farmers and Indigenous peoples are eroding, as biological products and processes become subject to exclusive monopoly control under intellectual property systems. Both industrial patents and Plant Breeders’ Rights, for example, increasingly criminalize seed saving; prohibit research using proprietary seeds; and restrict access to and exchange of seeds, plants or breeding materials. Once a resource is privatized, it is likely that a community will no longer have the legal right to use it, may no longer be able to afford to buy it, and may lose the power to decide how it is used. Knowledge rights are crucially linked to how people live in less developed parts of the world.

Chapter 6 on Farmers’ Rights and IPRs, established the propensity of the patent regime to infringe upon livelihood rights of the farmers. Infringement of knowledge rights also may eventually lead to a loss of control over resources and actually infringe upon the livelihood and subsistence rights of those dependent on the resources in question. Take the case of Neem and the potential implication it can have for farmers. On the whole, the likelihood of Indian farmers experiencing negative economic consequences, on account of having to buy seeds, will depend on the future availability of the seed. Since neem is not patented in India and there has been a decline

and revocation of a number of neem patents, the availability of seeds is currently not a problem in India. However, it is hard to estimate if and how this would change. As the number of patents filed by large corporations, for native crops and genetic resources, increases there is a growing concern about the economic effects of these patents on indigenous people.

Take the case of U.S. Patent No. 5,894,079, the Enola bean (yellow bean) patent. The patent was granted to John Proctor, the president of seed company Pod-Ners, LLC, after he brought the bean seeds back from Mexico. With the patent granted, Proctor had an exclusive monopoly on yellow beans and could exclude the importation or sale of any yellow bean exhibiting the yellow shade of the Enola beans. From this, Proctor made 6 cents per pound in royalties.101 In Northwest Mexico, yellow beans like azufrado and mayocoba have been cultivated for centuries. These are the beans Proctor purchased in Mexico and are Enola's ancestors. Customs officials at the US-Mexico border are now inspecting beans, searching for any patent infringing beans being imported into the United States.102 Because of this bean alone and the threat of infringement, some export sales have dropped over 90%, also affecting the market for other non-yellow beans, and crucially affecting the farmers producing them.103

Agriculture is the primary source of employment and livelihood for 3 out of 4 people in poor countries. How does the patenting of their resources/knowledge affect these farmers? Farmers may be unable to grow the crops they have grown for generations without first paying royalties to patent holders. While some countries do not recognize patents on agriculture products, preventing their farmers from paying royalties, sweeping international trade agreements threaten this and could change the face of agriculture globally. The extent to which the livelihood of farmers in poorer countries is secured depends in a large measure, therefore, on the extent of monopoly control permitted in the market through compliance with patent laws. The greater the monopoly, the greater the dependence of farmers and other users on market mechanisms, and the greater their vulnerability. Indigenous peoples are vectors of indigenous knowledge. Their sustenance

is compromised when their communal property is appropriated. It should be their right and not a privilege to protect their cultural spaces and their subsistence livelihoods.

Limitations of the Intellectual Property Rights Regime in Protecting Traditional Knowledge

It is evident that international instruments are needed to protect indigenous peoples and local communities against forceful external interests but it is a moot point whether the right way to protect their interests is to implement a system of intellectual property rights or whether we need entirely different institutional arrangements and sets of norms. The central point that this chapter seeks to put forward is that intellectual property rights, as upheld by TRIPS, is contrary to the ethos and purpose of the sovereign rights of traditional people over their knowledge and resources.

Review of Art. 27.3(b)

In Section 5, the TRIPS Agreement lays down the minimal standards of patent protection (Articles 27 through 34). As a whole, Article 27 of the TRIPS Agreement defines which inventions governments are obliged to make eligible for patenting and what they can exclude from patenting. Inventions that can be patented include both products and processes, and should generally cover all fields of technology. Article 27.3(b) describes inventions that Members may exclude from patentability while, at the same time, specifically obliges Members to protect micro-organisms and certain biotechnological processes. Plant varieties have to be eligible for protection either through patent protection or a system created specifically for the purpose ("sui generis"), or a combination of the two. Article 27.3(b) prescribes a review of this very provision, respectively, of the optional exceptions to patentability. This review should take place four years after the WTO Agreement came into force, first one falling in 1999. The final drafting of this provision reflects differences and uncertainties among countries over the scope of protection to be given to such inventions and the concerns regarding the patentability of life forms. Article 27.3 (b) is not an easy provision to comprehend.

One of the main ideas behind the review provision was to reassess the manner in which TRIPS dealt with the commercial use of traditional knowledge and genetic material by those other than the communities or countries where these originate, especially when these are subjects of patent applications. The first review took place in 1999 and the second in 2003; the primary area of concern expressed by developing countries of the South was about the grant of patents or other
IPRs covering traditional knowledge, to persons other than those indigenous peoples or communities who have originated and legitimately control the traditional knowledge. Secondly that traditional knowledge is being used without the authorization of the indigenous peoples or communities who have originated and legitimately control it and without proper sharing of the benefits that accrue from such use.  

**TRIPS Obligations under Article 27 (3) b**

<table>
<thead>
<tr>
<th>Members may exclude from patent protection:</th>
<th>Members need to provide protection to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plants</td>
<td>Micro-organisms</td>
</tr>
<tr>
<td>Animals</td>
<td>Non-biological processes</td>
</tr>
<tr>
<td>Essentially biological processes for the production of plants or animals</td>
<td>Microbiological processes</td>
</tr>
<tr>
<td>Plant varieties</td>
<td>Plant varieties (by IP system which may be patents, a sui generis alternative, or a combination)</td>
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</table>

Source: Graham Dutfield, UNCTAD-ICTSD, page 30

The review meet of the TRIPS council in 2003 put forward the concerns of developing countries with a rich heritage of biodiversity resources and valuable traditional knowledge. A number of South American countries together with India submitted that: “given the TRIPS Agreement requires countries with traditional and indigenous communities to provide intellectual property protection for a broad range of subject matters including new ones such as plant varieties, biological materials, lay-out designs and computer software, it is only equitable that traditional knowledge should be given legal recognition. Indeed, it is the responsibility of the international community to create an egalitarian system for the availability, acquisition, maintenance and enforcement of intellectual property rights, which does not *a priori* exclude any section of the society”\(^\text{106}\). The need to reconcile provisions of the TRIPS agreement, which considers IPRs to be individual/private rights, with international treaties and undertakings like the CBD, International Undertaking on Plant Genetic Resources, the model law of the Organization of African Unity

\(^{104}\) Refer Note by the Secretariat. WTO Council for TRIPS. The Protection of Traditional knowledge and Folklore; Summary of issues raised and points made. P. 2, point No. 7. Available at http://www.ige.ch/e/jurinfo/documents/IP-C-W-370.pdf. Visited 25-01-08

\(^{105}\) Bolivia, Colombia, Ecuador, Nicaragua and Peru, IP/C/W/165; Cuba, Honduras, Paraguay and Venezuela, IP/C/W/166.

\(^{106}\) India, IP/C/M/28, para. 128.
(OAU), which recognize and protect the rights of local communities, farmers and breeders, was emphasized. Moreover, it was highlighted by these countries that the legal protection of traditional knowledge would improve confidence in the international intellectual property system.\textsuperscript{107} The African countries again reiterated that any protection of genetic resources and traditional knowledge will not be effective unless and until international mechanisms are found and established within the framework of the TRIPS Agreement. Other means, such as access contracts and data bases for patent examinations, can only be supplementary to such international mechanisms, which must contain an obligation on Members collectively, and individually to prohibit, and to take measures to prevent, the misappropriation of genetic resources and traditional knowledge.

The review meet of WTO in 2003 highlighted the inadequacy of the system of intellectual property rights adopted by the WTO and its member nations in addressing issues of biopiracy and protection of traditional knowledge. This occurs particularly in cases where the patentees do not follow appropriate definitions of the criteria for patentability or appropriate procedures. Secondly the definition of prior art/use does not recognize information available to the public through use or oral traditions outside their domestic jurisdictions. Prior art, in the form that is adopted in the West, comprises just earlier disclosures in writing and not what is already publicly known or used anywhere in the world. Prior art in the case of traditional knowledge originating in one country is not widely known or documented and available to patent offices all over the world. Often traditional knowledge exists only in oral form or, if documented, is available in languages that the patent authorities are not familiar with. This means that even when the country of origin does not grant patents on a claimed invention on grounds that the source of the invention lies in the public domain, the invention can be patented in other countries where this knowledge is not in the public use or domain. When such patents are granted, as in the case of Enola beans from Mexico, the economic value of the knowledge of local communities gets reduced, the development and use of their knowledge in the global market-place constrained which suffered huge export revenue loses and this may facilitate others' use or exploitation of their knowledge without any rewards to them.

Development of databases on traditional knowledge would help resolve this problem, at least partially. Documentation, as has been attempted by Traditional Knowledge Digital Library

\textsuperscript{107} EC, IP/C/M/35, para. 238-9, IP/C/M/30, para. 145.
will, to a large extent, circumvent this problem and put up a case for prior knowledge, in patent challenges, specifically for those within the ambit of the document. Patent offices would take decisions based on the documents providing evidence of prior informed consent and benefit sharing only when the validity of a patent is challenged in the pre- or post-grant opposition or revocation proceedings. For those patents whose validity is not challenged but which are derived from traditional knowledge or those that continue to reside in oral traditions remain vulnerable and susceptible to bio-piracy and potential subjects of valid patents.

This raises a vital question: Is the legitimacy and legal recognition of traditional knowledge based merely on documentation and developing databases on traditional knowledge, or is the issue of knowledge rights of peoples over their centuries old knowledge systems a broader claim? This chapter argues that the issue of patenting and the threat it poses to traditional knowledge, is not linked to whether a patent has been successfully challenged, revoked or not, or whether there is ample protection through documentation of various traditional knowledges. The right to challenge, through establishment of prior knowledge/use, is not a sufficient right to ensure either protection or to put knowledge rights claims at par with Western modern sciences. The challenge to a patent is a costly and an intricately legal process, linked to too many conditionalities which cannot be fulfilled by non-resourceful, non-legal societies. For instance, there ought to be demonstrable proof of prior art failing which no legal claim contesting ‘novelty’ can be made. On the other hand if a patent claim is proved as obvious, only the prior existence of TIK in question is established. Even if there is a successful patent challenge it does not establish the intellectual property rights of the community in question. It only ensures, temporarily, that the specific knowledge does not belong to a domain over which any individual or institutional rights claim can be established. In this sense the right to challenge a patent is at best, to use Becker’s classification\textsuperscript{109}, a secondary right. Secondary rights are those “which are entailed by the existence of another right, and is extinguished when the primary right is extinguished.” The right to challenge is at best a specification of the conditions under which the patent holder’s rights

\textsuperscript{108} Initiatives have taken in India to document the wealth of its traditional knowledge heritage in a format recognizable and accessible by the international Intellectual property regimes and laws. An ambitious $2m project, christened TKDL, an encyclopaedia of the India’s traditional medicine was created in an effort to stop people from claiming them as their own and patenting them. The Indian library contains information on 36,000 formulations used in Ayurveda — India’s 5,000-year-old system of traditional medicine. The information — presented in English, French, German, Spanish and Japanese — was created in a format accessible by international patent offices to prevent the granting of inappropriate patents. India’s TKDL in fact became a model for other South Asian countries who are attempting a similar documentation. According to NISCAIR Director V.K. Gupta data on 65,000 formulations in Ayurveda, 70,000 in Unani and 3,000 in Siddha had already been put in the TKDL. The data relating to only 7,000 formulations each in Unani and Siddha, and 1,500 postures in yoga remained to be included and expected to be included by December 2007.

\textsuperscript{109} Lawrence C. Becker, Property Rights, Philosophical Foundations (London: RKP, 1977), 7
A second form of protection which has been accorded to TIK is in the form of benefit sharing mechanisms which are being evolved and which are found consistent with TRIPS provisions. As a corollary to the setting up of biodiversity registers and TK databases, the concept of benefit-sharing has also been put forward. Simply put, it seeks to provide a form of monetary compensation for the use of local people’s knowledge. Benefit-sharing is directly linked to the idea that the knowledge of farmers and local communities is not susceptible to fulfilling patenting criteria or even that it should not be included in the patent system. There is no hint that the creators and holders of knowledge may be the owners of these resources and should thus have the right to determine whether they want to sell and at what price. Overall, benefit-sharing constitutes a useful strategy to ease some of the adverse impacts of bio-piracy. Without benefit-sharing, such knowledge may be ‘taken’ from its current holders without any form of acknowledgement or compensation. However, benefit-sharing does not contribute to the definition of an alternative regime to patents. Indeed, while it seeks to limit the impact of the introduction of patents in the field of biological resources, it does not seek to provide any rights to current holders of knowledge. In this sense, it assumes that local people do not have intellectual property rights over their knowledge and that a monetary reward constitutes a sufficient compensation.

Intellectual property rights, like other property rights, are aggregates of different sorts of rights and rights-correlatives. The right to possess/own is to be sharply distinguished from mere protection of possession which is what the ‘prior art’ clause or benefit sharing mechanisms seek to do. The right to possess, i.e. to have ownership, is a claim right to have possession, not merely the liberty to keep. The ‘liberty to keep’ granted to the traditional knowledge holders as an aftermath of a successful challenge or through an entry into TK documentation, only states that others have no claim on it in the form of patents or other intellectual property rights; it does not establish the traditional holder’s intellectual property rights claim. It only establishes that monopoly of use or possession cannot be granted to a present or potential patentee. There is neither an interference with use nor possession that is foreclosed. A non-patentee can continue to use neem products or continue to commercialize it without a legal infringement of traditional

110 Ibid, 8-14
111 The concept of benefit-sharing has been enshrined in the proposed Biological Diversity Act, which provides that the national biodiversity fund shall be utilized, for instance, for “channeling benefits to the conservers of biological resources, creators and holders of knowledge”.

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knowledge rights. This is an essential feature of non-tangibles like knowledge where simultaneous possession and use is possible, unless legally prohibited. What is being argued here is that while traditional, indigenous knowledge continues to bear characteristics of intangibles being which do not fulfill the criteria of separatedness, excludability and alienability, other forms of knowledge, the individualized, western scientific versions, have a ‘thing’ like status conferred on them making them alienable, separate and excludable, and therefore viably an applicant for intellectual property rights.

Globally, the knowledge rights of the traditional peoples have a purely ‘derived status’. Their status is derived from the presence or the lack of legitimacy of a patent claim that uses TIK as its basis. TIK rights, as a legal claim for being considered as intellectual property, does not exist. There is not much of a legal claim for the consideration of alternate knowledge rights regimes such as ‘community property rights’. As Joel Feinberg states ‘the legal power to claim one’s right or the things to which one has a right, seems to be essential to the very notion of a right. A right to which one could not make a claim would be a very “imperfect” right indeed!”

CONCLUSION

This chapter has aimed to test the initial hypothesis that intellectual property rights do not easily conjoin with other rights, particularly the third generation rights which have become dimensions of human rights today, for instance the right to livelihood, farmers’ rights, health rights and in the present case, knowledge rights. Since the adoption of the Universal Declaration of Human Rights in 1948, intellectual property has been considered a fundamental human right of all peoples. The relationship between human rights and contributions to knowledge is however arguably controversial. The International Covenant on Economic, Social and Cultural Rights (ESCR Covenant) is in many ways the most crucial legal instrument through which the relationship between the two can be examined. On the one hand it recognized the rights to self determination (Art. 1) food and clothing (Art. 11), work (Article 6), physical and mental health (Art.12) as fundamental human rights. The common feature of this cluster of rights is the right to

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113 Article 27 of the Declaration provides that: 1) Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits. 2) Everyone has the right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author. http://www.un.org/Overview/rights.html.
'human' conditions of living, in that they all emerge as implied rights of the most fundamental of all rights—the Right to Life. On the other hand it recognizes in Article 15 individual or groups that make intellectual contribution that benefit society. Although it does not mention or imply that these rights in any way refer to the cluster of rights related to the intellectual property regime, by implications these rights may be effected through the intellectual property regime.

The notion of knowledge as a human right may at times be appropriated as a justificatory premise for the claim of intellectual property rights. The emphasis of the existing western intellectual property rights regime on individual proprietary rights does not address the collective and the symbiotic nature of traditional knowledge. Because western IP law is based on individual property ownership, its aims are often incompatible with, if not detrimental to, those of traditional communities. For many traditional communities, intellectual property is a means of developing and maintaining group identity and survival, rather than promoting individual economic gain. Intellectual property rights raise a number of concerns with regard to their impact on the realization of other human rights in general and food, health and livelihood in particular. There is therefore an apprehension that there are some human rights, far more basic and fundamental in nature, whose realization may be affected in countries that adopt or strengthen intellectual property norms based on their commitment to the TRIPS framework. The status of knowledge as a human right therefore needs to be qualified, perhaps re-examined. This chapter has sought to establish the premise that some knowledge rights, i.e. those that are linked to issues of survival, food security, livelihood rights, ecological sustainability etc. have a claim as a human right, while others, like the knowledge rights protected by the IPRs, are not. This chapter makes a crucial distinction between the knowledge rights of the traditional peoples and the knowledge rights in the form of Intellectual Property rights. The latter, it argues, is not an aspect of human rights and is best an economic entitlement to returns on capital invested.

The key question that is being addressed here is whether the notion of intellectual property rights can invoke current conception of knowledge as a human right? When 'knowledge as a human right' is invoked to provide the justificatory premise of intellectual property rights, the conception of human rights become dangerously close to being Eurocentric. This is so because they do not serve the understanding of knowledge systems that are culturally pluralistic and counter-hegemonic to Northern epistemic traditions.

Human rights are related to rights which are far more fundamental and basic, in that they outline a cluster of rights which seek to promote conditions that preserve what is 'human'. They are a
special sort of inalienable moral entitlement. They specify the minimum conditions for human dignity and a tolerable life and are internationally evolved norms that help to protect all people everywhere from severe political, legal, and social abuses. What is being argued here, however, is that claims of intellectual property as fundamental human rights fail the basic criteria of basic rights and freedoms. The absence of these rights does not endanger the life or its quality for peoples and therefore does not merit a human right classification. Knowledge rights as IPRs are, in the ultimate analysis, a vehicle for compensation that rewards innovative activity at monopolistic margins which work as rewards by ensuring the elimination of competition. On the other hand knowledge rights in the case of traditional knowledge rights are crucially linked to livelihood and survival of traditional communities as well as of the ecology that sustains them. Not only do IPRs not meet the fundamental human rights criteria, they also infringe upon the fundamental rights of other peoples and communities, rights that are crucially linked to subsistence, survival, well-being of the people. Intellectual property rights, it is argued, foreseeably and avoidably renders the basic socio-economic rights of other human beings unfulfilled.

While intellectual property rights are more like economic entitlements, the knowledge rights of the traditional peoples are aspects of socio-economic rights. Knowledge rights among the traditional communities are linked to bio-diversity, sustainability, food security and livelihood rights, besides being aspects of cultural and intellectual autonomy and therefore are aspects of human rights. The previous chapter argued that Farmers’ Rights, crucially linked to right to livelihood and food security, are aspects of Human Rights. *This chapter argues that unlike the knowledge rights protected by TRIPS regime, the knowledge rights of the traditional, indigenous peoples are linked to their survival strategies and are therefore an aspect of human rights.* It is important to draw a distinction between the two knowledge rights in question so as to make a larger point that carries from the earlier two chapters. Rights are often conflictual in nature and may require adjudication in order to settle the conflicting claims being made. The terms of adjudication ought to be based on upholding and protecting prior rights like the right to life, subsistence and livelihood, sustained and drawn from the knowledge rights of the traditional peoples.

The work in this chapter also suggests that the prevailing notion of intellectual property rights establishes the primacy of western modern sciences over the knowledge systems of the traditional and indigenous peoples. Contemporary critiques of intellectual property rights from the perspective of TIK are symptomatic of a more fundamental, broader questioning of universalized,
essentialized and singular notions of science and its projects. It has led to a fundamental questioning of its foundational principles, including ideas of scientific rationality which institutions like TRIPS legitimize. A regime like intellectual property rights are enwrapped in the terms of modern expert science. This, as a number of critics have pointed out, obscures attention to alternative knowledges, sciences, and forms of socio-ecological orders that may exist in the public realm. During the WTO Seattle Ministerial Conference for the review of Article 27.3(b), Bolivia, Colombia, Ecuador, Nicaragua and Peru submitted a proposal, "Protection of Intellectual Property Rights Relating to the Traditional Knowledge of Local and Indigenous Communities." The paper states that: "The entire modern evolution of intellectual property has been framed by principles and systems which have tended to leave aside a large sector of human creativity, namely the traditional knowledge possessed by local and indigenous communities."

Science and technology studies (STS) needs to move away from the Durkheimian perspective that cultural and social situatedness was the mark of lower knowledge forms, and science was "independent of any local context." Local epistemologies and their associated value have come to have bear upon the ways in which science is understood to be constituted. Critical questions have been raised in the last fifty years or so about the biases and categories that have shaped our visions of rationality, science and progress in our everyday lives. For both intellectuals and social movements, the very idea of science as uncovering universal truths about objective reality and the idea of science as progress, has become problematic and, at times, suspect. The conventional approaches to scientific endeavour and objectivity, which persist today in institutions like the TRIPS, have tended to reinforce simplistic dualities such as the "modern" versus "traditional" and "scientific" vs. non-scientific. The traditional comes to be seen in this context as local and pre-scientific. The rationale behind TRIPS reinforces these dualities.

TK stands in complete contrast to western modern sciences, in terms of conceptualizations, the residential and proprietary status, generation and communication. It encompasses the beliefs,

116 3 Nov 1999 Reference: IP/C/W/165
knowledge, practices, innovations, arts, spirituality, and other forms of cultural experience and expression that belong to indigenous communities worldwide. TIK, unlike common perceptions, incorporates its own explanations of the natural world and has its own distinct database, its own ‘science’. Attempts to incorporate traditional or indigenous knowledge into the databases of WIPO or attempts to ‘use’ TK as ‘base’ data and information are attempts to re-engineer TK in terms and forms that are commercially and globally acceptable and viable. These framings essentially are an attempt to codify and measure one system of knowledge by the intellectual and cultural standards of another. It is important to note that in the negotiations to do with benefit sharing and compensation, what gets lost is the broader negotiation of meanings and identities which may not be an obvious area of dispute but are often an obvious outcome. Any attempt to recognize (in legal terms), compensate or protect indigenous knowledge using international patent law, highlights the difficulty of protecting one kind of cultural knowledge by another culture’s legal standards.

It is therefore important to underscore the fact that the IK system has developed and evolved differently from the western modern sciences and has been based on different validation principles. Traditional knowledge encompasses a wide variety of methods of application which range from the physical to the occult and spiritual. The application of such methods is largely influenced by the culture and beliefs dominant in a particular community to the extent that they may be ineffective when applied in a different context. The nature and the contextuality of IK becomes an important dimension in the claim for knowledge rights of the IK. It is the cultural and the contextual dimension which determines the unique character of each variant of IK, each bred and evolved within its own specific paradigmatic matrix.

Cases of appropriation of traditional knowledge by way of patents which are granted on derived applications are numerous, as has been mentioned earlier. They highlight the anomalies of trying to bring about heterogeneous knowledge systems under one intellectual property law system. The anomalies are related in some cases to the legal framework in place at the international level and in individual countries concerning traditional knowledge protection. In other cases, they are related to broader issues concerning sovereign rights over knowledge systems based on the recognition and advocacy for rights of the indigenous peoples over their knowledge and resources, and for the inclusion of equitable benefit-sharing mechanisms where the indigenous /traditional peoples become equal partners in biotechnological developments. The issue of
sovereign rights is, however, beyond that of merely evolving equitable benefit sharing mechanisms. Evolving benefit-sharing mechanisms is actually a process which fine-tunes the existing intellectual property laws in a manner that the conflicting concerns and issues can be resolved within the existing system of TRIPS without radical alterations which challenge the very notion of intellectual property rights. In a way, attempts at democratization of the intellectual property regime shifts attention from the innate confrontation between individualized intellectual property rights and community rights over knowledge resources embedded within the very notion of intellectual property rights.