INDIGENEITY AND KNOWLEDGE RIGHTS: A CASE STUDY OF NEEM

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It is often argued that the rights of the indigenous peoples are being violated when their access to resources and 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 the TRIPS regime becomes an international legal institution that fosters the intellectual dominance of the western modern sciences (WMS) 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 traditional knowledge systems (TKS); for an end to bio-piracy and the one-way genetic resource flow (reminiscent of the mercantile capitalism era); for the development of equitable benefit-sharing mechanisms; for community property rights, to name a few 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 article seeks to first locate knowledge rights in a case study—that of Neem—and outline the terms of conflict between intellectual property rights and knowledge rights of traditional-indigenous peoples. From there I draw larger conclusions about the inability of intellectual property rights to conjoin with knowledge rights of the traditional peoples which, I argue, are aspects of human rights as they are symbiotically linked with issues of subsistence and livelihood. I take forward one of the two central arguments of the book that rights need to be assessed in terms of the consequences—consequences which are rights sensitive.Just as rights claims derive from deontological grounds of morality, so also do they derive from consequentialist grounds of morality through a valuation of outcomes. An assessment of outcomes invariably raises issues of what rights? And whose rights? Consequential analysis, therefore, needs be cognizant not merely of the inherent capacities of a right but also of its capacity to generate outcomes for certain individuals or groups of individuals. The same right could generate different consequences for different people. This Article illustrates this point. Knowledge rights of the traditional peoples generate different consequences for right holder than do knowledge rights of the intellectual property holders. It is on these consequences that, I argue, terms of adjudication between competing claims of coequal rights

ought to be predicated. The stronger the relationship of the consequences with life protecting, life enhancing capacities, the stronger becomes its moral claim for a right. I argue, therefore, that the category of knowledge rights need to unpacked in terms what the right protects and for whom? One is linked to a more fundamental claim for dignified existence and subsistence, and the other to secured returns on capital investment, at times under conditions of risk. It is the former, that is, the right of traditional, indigenous peoples over their knowledges and associated resources, which stakes a claim as human rights. The right to life, and the rights which devolve from it, is most prior of all claims and have acquired an undisputed priority position in the lexical order of rights.

These two versions of knowledge rights are not just different but are also conflictual. Any attempt to club them together under a universal intellectual property system is likely to create epistemic hierarchies which threaten the domination of one by the terms of the other. Intellectual property rights infringe upon the traditional indigenous knowledge rights of vulnerable sections of society, whose sustainability is crucially linked to the sustainability of their eco and knowledge systems. It threatens the plurality and heterogeneity of knowledge systems, threatening to alter these in the image of western intellectual traditions. Finally, I 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 conception of intellectual property itself.

Traditional indigenous knowledge (TIK)[1] 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 subsequently dominant culture[2], 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. TIK 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. TIK also encompasses belief systems that play a fundamental role in a people's livelihood, maintaining their health, and protecting and replenishing the environment. TIK is thus the totality of all knowledges and practices, whether explicit or implicit, used in the management of socioeconomic, spiritual and ecological facets of

[1] Some ethnographic studies prefer the usage of the term 'local'. For instance, according to Warren and McKiernan 'Indigenous Knowledge (IK) is local knowledge that is unique to a given culture or society' Source? Maurial states 'Indigenous knowledge is *local* because it is the result of the quotidian interactions in indigenous people's territories' or in Deiet al.'s words, 'indigenous knowledges are those acquired by local peoples through daily experience'. See, Maurial, Mahia, 'Indigenous Knowledge and Schooling: a Continuum Between Conflict and Dialogue', in *What is Indigenous Knowledge? Voices from the Academy*, Semali, Ladislaus M., and Joe L. Kincheloe (eds) (New York and London: Falmer Press, 1999), p. 63; Dei, George, Jerry Sefa, Budd L. Hall, and Dorothy Goldin Rosenberg, *Indigenous Knowledges in Global Contexts: Multiple Readings of our World* (Toronto: Universityof Toronto Press, 2000), p.19.

[2] ILO, 1989:

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[3] TIK 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 un-technical 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. [4]

Three features of TIK are important for our consideration here: a) that the development of TIK, covers almost all aspects of life of the holders and is a matter of survival to the people who generate these systems;[5] b) that TIK is often collective in nature and is therefore eludes basic considerations (divisibility) for individuated property claims.[6] Such knowledge systems are cumulative, intergenerational, representing generations of experiences, observation and trial and error experiments; c) that TIK exists in a dialectical 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)[7] to any other because of the vital linkages that these knowledge systems have with their environment.[8] The relationship with and to nature, human agency and human solidarity underpins the knowledge system and the human existence around it. The unique cosmology and the

[3] For details on categories of indigenous knowledge see Odora Hoopers, *Culture, Indigenous Knowledge and Development*, (Johannesburg: CEPD, 2004), Section 2.2pages?; 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).

[4] *Elements Of A Sui Generis System For The Protection Of Traditional Knowledge*, (WIPO, Intergovernmental Committee on IP and Genetic Resources, Traditional Knowledge and Folklore, 3rd Sess., 2002.) WIPO/GRTKF/IC/3/8.

[5] Grenier, Louise *Working With Indigenous Knowledge: A Guide for Researchers* (Ottawa: International Development Research Center, 1998), p. 1.

[6] 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.

[7] Berkes Firket writes, 'TEK represents experience acquired over thousands of yearsof direct human contact with the environment'. Berkes, Firket, 'Traditional Ecological Knowledge in Perspective', in *Traditional Ecological Knowledge: Concept and Cases*, J.T. Inglis (ed.) (Ottawa: International Development Research Centre, 1993), pp.1–9.

[8] Writing about the American Indians Capra stated that ecological awareness arises 'only when we combine our rational knowledge with an intuition for the nonlinear natureof 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.' Capra, F., *The Turning Point: Science, Society and the Rising Culture* (New York: Simon & Schuster, 1982), p. 41.

world view of the traditional societies underline all categories of their implicit and explicit knowledges making them non-individualistic, essentially communal and non-amenable to propertization for any kind of proprietary rights to be legitimately claimed for them.

Without dwelling too much on the binaries of TIK and western knowledge systems it would suffice to assert, in this context, that TIK systems are fundamentally differentiated and different from western modern sciences (WMS) that that their respective alternate vocabularies render them incommensurable entities. Recent attempts to integrate TIK, it can be argued renders them commensurable, but all such attempts have tended to recast the TIK in the vocabulary of WMS which does not make them commensurable but simply appropriable.

What has perhaps compelled a dialogue between the two, particularly in the post TRIPS era, has been the growing interest in alternate ways of healing, growing crops, alternate genetic sources etc. A growing number of scientists, and policy makers are aware of the contribution TIK can make to a more sustainable development,[9] protection of biodiversity,[10] and as a starting point in the construction of a truly alternative agriculture.[11] TIK 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'.[12] There is thus felt a pressing need to access this wealth in order that the world at large can benefit from their wisdom and the resources. This initiated the intensified search for commercially profitable substances and resources among the ecosystems of indigenous peoples, in part compelled by the limits of the WMS.

INTEGRATION OF TRADITIONAL INDIGENOUS KNOWLEDGE

The intensification of interest in the commercial value of indigenous peoples' knowledge and

[9] Viergever Marcel,'Indigenous Knowledge: an Interpretation ofViews from Indigenous Peoples', in *What is indigenous knowledge? Voices from the academy* M. Ladislaus Semali, and Joe L. Kincheloe (eds) (New York and London: Falmer Press, 1999), p. 341

[10] Iwanaga, Masa,'*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 ProceduresFor In Situ Conservation On-Farm, 25th–29th August 1997, Jarvis, Debra I., and Toby Hodgkin (eds) (International Plant Genetic Resources Institute, Rome. Italy. 1998), vi check use of Title case for name of paper/ workshop.

[11] Kloppenburg Jack (ed), *Seeds and Sovereignty: The Use and Control of Plant Genetic Resources*, (London: Duke University Press, 1988); Kloppenburg, J., 'Social Theory and the De/reconstruction of Agricultural Science: Local Knowledge for an Alternative Agriculture', *Rural Sociology*, 56 (4) (1991), pp. 519–48. Some agricultural research centerslook at TIK as a key component of sustainable agricultural practices; others have been in charge of researching and cataloguing existing TIK.The Center for Indigenous Knowledge for Agriculture and Rural Development (CIKARD), established in 1987 at Iowa State University, is an example of the latter

[12] Firket Berkes, 'Traditional Ecological Knowledge in Perspective', in *Traditional Ecological Knowledge: Concepts and Cases*, Luian T. Inglis (ed.) (International Program on TIK: International Development Research Center, 1993) Is TIK used in original??

resources and the subsequent institution of intellectual property rights, emergence of indigenous peoples as an 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.

The effort to source, integrate, exploit TIK systems has gradually acquired global and multi industry 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 becoming a dynamic and profitable enterprise. Benign biological products from the bio-diverse global 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.[13] 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.

In terms of the structuring of capital incentives within the biotechnological industry, one of the most significant events to occur during that time period was the 1980 United States Supreme Court ruling in the *Diamond v. Chakrabarty*[14] case, 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.[15] Prior to this ruling, it was generally recognized that living organisms and cells were 'products of nature' and thus were not patentable. In the United States, the Plant Patent Act, 1930 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

[13] Suman Sahai, *Commercialisation of Indigenous Knowledge and Benefit Sharing*. UNCTAD Expert Meeting on Systems and National Experiences for Protecting Traditional Knowledge, Innovations and Practices. (Geneva 30 October–1 November 2000). Refer point 15. available at http://www.comunidadandina.org/desarrollo/6_India.pdf .Accessed15-12-2007

[14] June 16, 1980 447 U.S. 303, 206 USPQ 193.

[15] 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.

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 companies rose from fifty million dollars to over eight hundred million between the years of 1978 and 1981.[16] 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).[17] The expansion of intellectual property rights in the United States to include microbiological material can thus be seen as an important motivation for global extension of intellectual property rights in biological/natural realm.

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: High Throughput Screening (HTS) 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.[18] 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 became 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 Convention on Biodiversity (CBD). The CBD fundamentally to reconceptualized 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 national legislation. 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

[16] Rabinow, Paul, *Making PCR:A Story of Biotechnology* (Chicago: University of Chicago Press, 1996), p. 27 Is PCR used in original title?

[17] Available at <http://www.acephale.org/bio-safety/IoC-ipr.htm>. Accessed on 12-1-08.

[18] *Apparatuses and Methods for Creating andTesting Pre-formulations and Systems.* Available at <http://www.patentstorm.us/patents/6939515-description.html.>

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 across 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 CBD 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 was considered,'their resources' and 'their knowledge'.

The final defining legal event to be considered here is the TRIPS agreement which created international standards for intellectual property law and obligated member nations to commit to meeting these standards. A significant contributing factor is the high profitability of the biotech ventures which became the basis for patented innovations and which then ensured greater profits at monopolistic levels. The TRIPS framework became the driving force behind the spurt in industrial growth in this sector.

The relationship between the spurt in industrial growth and intellectual property protection is well documented. 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.[19] 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'.[20]

Thus, biotechnology is revolutionary in yet another sense—it has circumvented recurring diminishing returns, and gave a renewed push to industrial growth. Protected by intellectual property rights the biotechnology sector became one of the main reasons for exports spurtsin many western economies. Gadbaw and Richards estimate that the percentage of the US country exports with a high intellectual property content rose from 9.9 per cent in 1947 to 27.4 per cent in 1986.[21]

[19] Price, Steven, 1992, 54. Quoted in*Biotechnology and IP Rights available at* http://www.acephale.org/bio-safety/IoC-ipr.htm (last accessed on 12 January 2008.).

[20] Juma, Calestous, *The Gene Hunters: Biotechnology and the Scramble for Seeds* (Princeton Univ Pr, 1989), p. 108.

[21] Dutfield, Graham, *IP Righst Is it IP Rights in the Original?Cite Exact Title of Books,Trade and Biodiversity* (London:

Exports,as measured by royalties and licensing fees, amounted to about US $27billion in 1995, while imports amounted to only US $6.3 billion.[22] 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 and agro research and development. Indigenous communities participated in ethno-botanical projects, which used/use indigenous knowledge to help facilitate the collection of particularly efficacious genetic resources.[23] 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'.[24] By conferring a property right to the biotechnological innovators 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.

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 this article, highlights the issues of inequitable terms of trade, non-existent or inequitable benefit sharing norms, and bio-piracy,all of which are outcomes of epistemic hierarchies implied and instituted by the TRIPS regime.The TRIPS agreement is one of the mechanisms which facilitates and provides incentives, in the form of patents and related intellectual property rights,for scientific innovation and adjudicates on what comprises science and innovation which then become the basis for what comprises rights of ownership. Recognizing intellectual property of one kind and not recognizing the knowledge rights of the other kind, the one that exists in a 'non-scientific' domain, reinstates the cultural and cognitive status assumed by the West. As Pat Mooney of Rural Advancement Foundation International (RAFI)

Earthscan Publications, 2000), p. 10.

[22] Ryan, M., *Knowledge Diplomacy: Global Competition and the Politics of IP Is it IP Rights inthe Original?Cite Exact Title of Books* (Washington, DC: Brookings Institution Press, 1998

[23] 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 theplants 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 bio-prospecting. RAFI/ETC publishes annual 'Captain Hook awards' for notable achievements in bio-piracy.

[24] By Paul Rabinow, *Making PCR: A Story of Biotechnology*, p. 20. Check name

states, 'The argument that intellectual property is recognizable when performed in laboratories with white lab coats is fundamentally a racist view of scientific development.'[25] Dominant modes of cognition and knowledge generation, fostered and protected by TRIPS seeks to integrate the relatively isolated but resource-rich traditional knowledge systems with global systems of biotechnology and intellectual property. It is the effort to integrate and the terms of this integration that connects the knowledge debate with perspectives on human rights.

INDIGENOUS KNOWLEDGE AND THE TRIPS AGREEMENT

There are two important international conventions that have a bearing on intellectual property rights and traditional knowledge systems (TKS), namely, the TRIPS agreement and the CBD. The CBD is the only major international convention that assigns ownership of biodiversity to indigenous communities and individuals, albeit through the state and asserts their right to protect this knowledge. Twos of this convention are particularly relevant:

1. **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.'

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

Article 8(j) of the CBD recognizes communal knowledge, rights of indigenous cultures to preserve their knowledge and resources, clearly at odds with the individualistic conception embodied in the TRIPS agreement.[26] 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.

The TRIPS agreement is a key international agreement promoting the harmonization of national IPR regimes.[27] The effect of this harmonization would be to provide minimum standards and to make national IPR regimes more similar to each other.[28] Although the TRIPS agreement covers four types of IPRs, namely, patents, geographical indications, undisclosed information (trade secrets) and trademarks, it does not acknowledge or distinguish between indigenous, community- based knowledge. Furthermore, it makes no reference to the protection of traditional knowledge. While

[25] 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. Source???

[26] Susan Sell, *Private Power, Public Law:The Globalization of IP Rights* (Cambrdge: CUP, 2003), p. 144.

[27] 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

[28] For details see Graham Dutfield, *IP Rights,Trade and Biodiversity*, (2000), 17. Box 3.1

there is mention of sui generis forms of protection (article 27.3b) TRIPS agreement demands that ought not to run contrary to the TRIPS provisions.[29] Part of 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.

According to article 7 (Objectives) of the TRIPS agreement, protection and enforcement of IPRs,'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 implies 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 the TRIPS agreement, more extensive forms of 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.[30] However, 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 framework.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 they meet the criteria of novelty, inventive step and utility. Although there is no reason why such categories of rights may not apply to various expressions of traditional knowledge[31], there are several characteristics of traditional knowledge

[29] Duttfield G., *IP Rights Check name??, Trade and Biodiversity: Seeds and Plant Varieties*, pp. 18–19. Kenya for example passed an Industrial Property Bill in 1989 that allows petty patents relating to traditional medicinal knowledge; *Sui generis* laws that have been passedin Panama in June 2000—Panama's Special System for Registering the Collective Rights of Indigenous Peoples, for the Protection and Defense of their Cultural identity and Traditional Knowledge, and Setting out other Provisions. Is this whole thing name ofthe law? If not Edit capitalisation, According to WIPO 'the *sui generis* system of Panama actually constitutes the first comprehensive system of protection of traditional knowledge ever adopted in the world'.), 'Review of existing IP Protection of Traditional Knowledge', Intergovernmental Committee on IP and Genetic Resources, Traditional Knowledge and Folklore, Third Session: Geneva, June 13 to 21, 2002. (WIPO Secretariat,2002) WIPO/ GRTKF/IC/3/7

[30] For example, the knowledge of how certain plants within an indigenous group's homeland are used to treat fever would fall under IP rights. Likewise, particular understandings of the land, ecology, or environment of a certain area may also fall underIP rights. The key point is that IP 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.

[31] For a few cases of existing IP mechanisms, 'geographical indications, copyrights, trademarks and patents, that have been used to protect a few instances of TIK 'Review of existing IP Protection of Traditional Knowledge' Intergovernmental

that create barriers to protection through the use of existing forms of IPRs.[32] prevails, leading to an uneasy fit of any form of individualistic Western style appropriation as recognized and rewarded by the IPR regime.

Ownership patterns of TIK 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, argue that because TIK is primarily common knowledge and a product of collective experience without an individual act of creation, it gets precluded from being seen, from the point of entitlement theory, as intellectual property.

[33]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 TIK, innovations and rights of indigenous and local peoples. [34]One of the prime reasons is that the locus of ownership cannot be clearly identified for knowledge systems that are essentially inter-generational and a product of communal endeavour.

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, the prime ambition being to respond to changing ecology and needs. It never actively endeavours to be 'novel' or distinct from nature. 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.[35] In some Indian medical

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Committee on IP and Genetic Resources,Traditional Knowledge and Folklore,Third Session: Geneva, June 13 to21, 2002. (WIPO Secretariat, 2002). PAGE??? see the points no. 9-12 Are they points? Or paragraphs? How are they referred to in original? on how INCOMPLETE???. Available at <http://www.wipo.int/edocs/mdocs/tk/en/wipo_grtkf_ic_3/wipo_grtkf_ic_3_7.doc.> Visited on 10-1-08.

[32] Ng'etich, Kibet A., *Indigenous Knowledge, Alternative Medicine and IP RightsIS it IPin the Original title? Concerns in Kenya*. 11th General Assembly of What Organisation???. Theme: Rethinking African Development: Beyond Impasse,Towards Alternatives (Maputo, Mozambique, 6-10 December 2005) Available at <http://www.codesria.org/Links/ conferences/general_assembly11/papers/ngetich.pdf> .Visited on 12-12-2007.

[33] Ibid.

[34] Stenson A., and T. Gray, 'Cultural Communities and IP Rights Check Title? in Plant Genetic Resources', in *Justice, Property and Environment: Social and Legal Perspectives*, T. Hayward and J. O' Neill (eds) (Aldershot and Broof field: Ashgate Publishing, 1997), pp.178–93.

[35] 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, 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 protects an expression and not necessarily

practices, certain medical potions acquire their potent properties only when they are blessed by the gods, again denoting a blur in the conception of natural and 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. This has implication for intellectual property claims,unless a product is substantially different from one found in nature, and is thus the result of a 'non-obvious' human invention, the product or its knowledge cannot be considered a subject of intellectual property.

A third feature which prevents TIK from being regarded as intellectual property is the element of disclosure. Some traditional knowledges, especially in China and India[36] 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.[37] When TIK is disclosed it becomes publicly available and hence, under current IPR rules, lies in the public domain making it 'obvious' form of knowledge that cannot be claimed as intellectual property. Kept in public access, these forms of knowledge acquire properties of public goods. Even the recent disclosure practices, a result of attempts by the Doha Declaration to align the TRIPS agreement with disclosure principles enumerated in CBD, sometimes find it difficult to locate the beneficiary, for the historical trial of cumulative knowledge is extremely fuzzy. 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 used to serve as a tool to not only deny the claims of TIK 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'.[38]

On the other hand, if forms of TIK are undisclosed as, for instance, amongst Kenyan traditional medical practitioners[39] and remain non- codified, they get termed as 'folk', 'rural', 'tribal' and

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the knowledge in that expression. A growing public policy debate is now whether traditional knowledge should be protected under other forms of IP law, particularly patent law

[36] Roht-Arriaza, N., 'Of Seeds And Shamans: The Appropriation Of The Scientific And Technical Knowledge Of Indigenous And Local Communities', *Michigan Journal of International Law*, 17 (919) (1996), pp. 919–965.

[37] Shankar D.,A. Hafeel, and T. Suma,'Cultural Richness of Green Pharmacy', *CompassNewsletter*, No.2 (1999), p. 10.

[38] Koning, M., 'Biodiversity prospecting and the equitable remuneration of ethnobiological knowledge: reconciling industry and indigenous interests', *IP Journal*, No.12 (1998) page?

[39] 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, Shiva,V., 'Biodiversity Conservation, People's knowledge and IP Rights', in *Biodiversity Conservation: Whose Resources? Whose Knowledge*? Vandana Shiva (ed.)

> '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 propertization. They also, it is alleged, exist in a 'non-commercial' form, valid and appropriate only 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. TIK 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.This is the language of modern science At play here is the ascendancy of scientific knowledge, first drawing out cognitive hierarchies, then homogenizing the 'other' in its own image.

A final barrier for TIK to become eligible for intellectual property protection is the prohibitive costs of registering and defending a patent or other IPR against a challenge or infringement. This effectively limits the availability of IPRs, depriving the vast majority of indigenous communities, primarily in developing countries. Aside from the costs involved, most of the carriers of TIK are well outside the domain and the levels of legal awareness required for registering a claim either for claiming or breach of their knowledge practices.

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 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.

Do the criteria reflect an intellectual and cultural bias? Does TIK need to be validated according to the western intellectual property norms in order for its legal status to be formalized?What happens to customary rights when confronted by the entire legal apparatus of scientific innovation and property rules?[40] Does protection accorded under access and benefit sharing mechanisms ever offer them the protection that customary rights provided them tacitly? These are important questions for they relate to the complex interplay of issues of rights, ecology, culture and justice. A process which begins with the limits of modern science, is turned on its head and ends as a project which

(Delhi: INTACH, 1994), pp. 4–6.

[40] A significant part of traditional medicine in remains secrets. Knowledge held by bone-setters, midwives or traditional birth attendants and herbalists, including knowledgeof 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) p?; Kokwaro, J.O., *Medicinal plants of East Africa* (East African literature Bureau, 1993). Quoted in Kibet A. Ng'etich, *Indigenous Knowledge,Alternative Medicine and IP Rights Concerns in Kenya,* page??

hegemonizes modern science. The events that occur between these two end points are of crucial significance What and who is subverted or subsumed to enable this transformation? Is it a matter of amending and fine-tuning the intellectual property laws in order to make them more responsive to dimensions of TIK, or of re- conceptualizing the very notion of knowledge as property?

I seek to argue here that the very notion of intellectual property is a notion that is incommensurate with 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 the TRIPS framework, even if democratized, is likely to result in the rewriting the history of TIK in terms western hegemonic intellectual and cultural traditions. Part of the process of 'democratization' is to strip rights (which offer protection to TIK, in this case) to their bare minimum so that they do not run contrary to the purposes of intellectual property protection in general. As a delegate at a WIPO Round Table in Sydney stated: 'One should not attempt to amend Western laws to cater for indigenous peoples. Attempts to do so will be doomed, because the intellectual property system and the needs of indigenous peoples are too distinct'.[41] The terms of integration envisaged by the international conventions and institutions like the UPOV, TRIPS framework, CBD are 'nothing less than controlled assimilation'.[42]

Demonstrating the epistemic and cultural hierarchies embedded in the notion and practice of IPRs is politics of Neem. The example of Neem, an emblematic of indigenous knowledge, provides a useful resource to understand symbolic politics of knowledge. Politics over the Neem patent demonstrates the extent to which the IP regime attempts to frame and structure TIK is in accordance with the principles of modern science. It symbolizes the appropriation of traditional knowledge as intellectual property; and the infringement of knowledge rights of the traditional and indigenous communities. It short, it plays out the entire gamut of issues that interface of intellectual property rights and TIK has come to represent.

NEEM PATENTS AND 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. India alone has more than 20 million trees.

[41] Roundtable by whom?, Sydney, Australia, June 18, 1998. Cited in WIPO Draft Report on 'Fact finding Missions on IP and Traditional Knowledge'. (1998–1999). July 3, 2000. Available at <http://www.wipo.int/tk/en/tk/ffm/report/interim/docs/7-1.doc>. Accessed 11-01-08

[42] Gray, Andrew 'The Impact of Biodiversity Conservation on the Indigenous Peoples,' in, *Biodiversity: Social and Ecological Perspectives*,V. Shiva, Patrick Anderson et al eds. (Penang, Malaysia:World Rainforest Movement, 1991), p. 71.

The past five decades witnessed intensive investigation and a 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.[43] It led to isolation and identification of hundreds of the active compounds, from various parts of the plant with pesticidal, fungicidal, bactericidal, anti-inflammatory, anti-tumor and other beneficial properties that found applications in the 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.

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 points 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 this Article 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.

[44] Knowledge residing in the public domain essentially prevents it frombeing patented, at least in India, where Neem products and processes to derive the products, would neither be 'novel' nor 'non-obvious'. In cases where the patenting of TIK is prohibited in the source country, such as in India, there is a possibility that the product, or a process, could be patented in the jurisdiction of another country. Consequently, there have been several attempts to patent Neem in other jurisdictions. Attempts to patent Neem are is only one example of a practice that is pervasive.

Neem Patents

Neem has been patented widely.[45] There have been numerous instances of challenges to Neem patent applications which have been successful in revoking the patents granted, but a number of Neem patents still exist. Since the 1980s, many Neem related processes and products have been

[43] For an exhaustive list of the research institutions and scientists involved in Neem research see Shiva Vandana, Radha Holla Bhar, K. Vijaylakshmi and K.S. Radha, *Neem* (Delhi: RFSTE, 2006), pp. 28–30

[44] The Fourth World Neem Conference, was held at Mumbai in 2002. Issues covered includedEnvironment and socioeconomic rights, animal and human health, chemistry, nematode control, fungus control, processing and product development, genetic improvement and afforestation. Conference report on 'Neem 2002: World Neem Conference' held in Mumbai from 27 to 30 November 2002 and organized by Neem Foundation, Mumbai

[45] For a list of patent claims on Neem refer to the Annexures in Shiva Vandana, Radha Holla Bhar, K.Vijaylakshmi and K.S. Radha, *Neem: Fight against Biopiracy and Rejuvenation of Traditional Knowledge*(RFSTE, 2006) pages?;Two other controversial US patents on Neem are US patent No 4946681—granted in 1990 for improving the storage stability of neemseed extracts containing azadirachtin; US patent No 5124349—granted in 1994 for storageof stable insecticidal composition comprising neem seed extract. Patents for Neem havebeen granted in India too—For details refer to the Neem Foundation website at <http:// www.neemfoundation.org/neem-articles/patents-on-neem.html>

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.[46] 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 CompanyW.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 Grace which covered a method of creating a stabilized azadirachtin (the active pesticidal ingredient found in Neem tree extracts) in solution, and the stabilized azadirachtin solution itself.[47] Subsequently, the EPA registered Grace's stabilized azadirachtin solution for use on food crops under the name Neemix.

Aside from Grace, Neem based pesticides were also marketed by another company, AgriDyne Technologies Inc., USA.[48] 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).The patent also covers the paste compound and the process of deriving micro-fibres from the branches and roots to include in the paste. Using Neem twigs to clean teeth is a common practice followed through out India, over millennia. The use of Neem as a dentifrice is thus neither 'novel' nor 'different'.The paste is merely 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. 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. 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 Patent Cooperation Treaty (PCT) patents—a total of 53 patents,[49] 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

[46] 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.

[47] US Patent No 5,124,349, Storage Stable Azadirachtin Formulation (issued 23 June 1992).

[48] AgriDyne had established a joint venture with 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 'The Neem Tree Debate.' *Biotechnology and Development Monitor*, No. 30 ((1997), p. 811

[49] *Down to Earth,* Vol. 4, No. 20 (March 15, 1996) PAGE?

Patent Office (EPO) to date, of which 22 have been granted, 28 are 'dead' for various reasons, and 9 are currently being examined.[50] These include claims for insecticides, fungicidal effects, methods of extraction, and storage, stable formulations of one of the active ingredients, azadirachtin, contraceptive, and 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.

An analysis of type of patents suggests that majority of them are for crop protection applications (63 per cent), followed by health care (13 per cent), industrial (5 per cent), veterinary care (5 percent), cosmetics (6 per cent) and others (8 per cent). 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 are owned by Certis—W.R. Grace (49) followed by Rohm & Haas (36), CSIR-India (14), Trifolio (9), Bayer (8) and EID Parry (6).[51]

The Neem Foundation data the largest number of patents is in USA (54) followed by Japan (35),Australia (23), India (14).[52] 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 per cent of all patents. One particularly intriguing European patent (patent no 436257 dated 10 July 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 by multinational corporations, such as the U.S. pharmaceutical company Rohm and Haas and most infamously agrochemical giant W.R. Grace.[53]

Two patents: (1) US Patent No 5,124,349 for 'Storage Stable Azadirachtin Formulation' issued on 23 June 1992 and (2) European Patent no 436257 for 'Hydrophobic extracted Neem oil' issued on July 10, 1991 are significant cases because on them converged the symbolic fight against appropriation of TIK made possible by the TRIPS laws. They became the focal point of the assertion of the right of the traditional indigenous peoples over their knowledge rights and their

[50] Shiva V., *et al.*, *Neem*, 174, Conference Report on 'World Neem Conference 2002'.

[51] Thakkar Pramila *Patents on Neem*. (31 October 2007). Available at <http:// Neemfoundation.org/index.php?option=com_content&task=view&id=26&Itemid=26> Visited on 31-1-08

[52] Ibid. For examples of some patents see refer to the Annexures in ShivaVandana, RadhaHolla Bhar, K.Vijaylakshmi and K.S. Radha,, *Neem: Fight against Biopiracy and Rejuvenation of Traditional Knowledge*(RFSTE, PLACE? 2006) pages? Two other controversial US patents on Neem are US patent No 4946681—granted in 1990 for improving the storage stability of neem seed extracts containing azadirachtin; US patent No 5124349—granted in 1994 for storage of stable insecticidal composition comprising neem seed extract. Patents for Neem have been granted in India too.For details refer to the Neem Foundation website at http://www.neemfoundation.org/neem-articles/patents-on-neem.html CHECK??

[53] The three partners joined forces to launch the Opposition: an organization from the country where the resource was stolen, an international organization representing organic users and producers of Neem products throughout the world, and an environmental political party, well positioned to pursue changes in the legal system itself to outlaw Biopiracy. And from within these organizations it was women who initiated the action and sustained it—an Indian, a Belgian, and an American.

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

Opposition to the European Neem Patent

The patent application was 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').[54] This pesticide was claimed to have the ability to repel insects from plant surfaces, prevent fungal growth, and kill insects and fungal pests at various life stages.

The patent grant was indignantly opposed in India for the use of Neem oil to repel fungi, bacteria, insects is as old as history. A patent challenge was filed on June 5, 1995, by Vandana Shiva of Research Foundation for Science, Technology and Ecology (RFSTE) (India), Linda Bullard of International Federation of Organic Agriculture Movements (Germany) and Magda Alvoet, Health and Environment Minister of Belgium.[55] The main contention was that an invention needs to be novel and non-obvious and there should be no evidence of 'prior art/use', and further, 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. The legal opposition filed by the three opponents was 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. 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' (article 56, EPC in the U.S. called non-obviousness).

In addition, the opponents charged that the patent was contrary to 'morality' (EPC, article 53a) 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' (article 83 EPC) and 'lack of clarity' (article 84 EPC) in calling for the revocation of the patent. Subsequently, the opponents requested an additional ground for opposition, namely that the patent constituted de

[54] Patent no 436257 dated July 10, 1991 The grant of a European patent was for 'A method for controlling fungi on plants comprising contacting the fungi with a Neemoil 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'

[55] The three partners joined forces to launch the Opposition: an organization from the country where the resource was stolen, an international organization representing organic users and producers of Neem products throughout the world, and an environmental political party, well positioned to pursue changes in the legal system itself to outlaw Biopiracy. And from within these organizations it was women who initiated the action and sustained it—an Indian, a Belgian, and an American.

facto a monopoly on a single plant variety, which is barred by article 53 (b) of the EPC.[56] 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'.[57]

Two expert witnesses from India were made to testify from the opposition bench: Udai 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 Abhay Dattaray Phadke of Pune, 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 on the basis of clearly demonstrated prior public use. It 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.[58] It was clear that the case was won on the basis of affidavits and testimony, and through them the establishment of 'prior use' and not on the basis of the moral claim.[59] The US government and W.R. Grace appealed to the next level within the 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 submissions and filings ensued before the case once again reached the level of an Oral Proceeding at the EPO.[60] The five- member Technical Board of Appeals needed only two hours to reach its decision. On 8 March 2005[61] 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.

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[56] Linda Bullard, Freeing the Free Tree (2005)

[57] V.Shiva, *Campaign against Biopiracy* (New Delhi: RFSTE, November 1999)

[58] 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 deemedto 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 January 2008.

[59] From'Decision revoking the European patent 436257'of the EPO,ref.Neemfungicide, dated 13.02.2001, Application No. / Patent No. 90 250 319.2-2117 / 0436257 / 01.

[60] 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.

[61] (Significantly on Women's Day) the three opponents were women

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 and biopiracy'.[62] 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. [63] In a press release on March 8th 2005, the Green parties 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'.[64]

Challenge to the US Neem Patent

Another contested Neem patent was the US patent no. 5,124,349 held by W.R Grace, 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.[65] 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'.[66] This challenge was seen as a critical test of the intellectual property laws established by the WTO. As trans-nationals and other enterprises from the global North scout remote regions of the South for genetic resources to patent, a process now

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[62] Vandana Shiva, Free Tree, *The Hindustan Times*, India. June 9, 2000.

[63] European patent No. 0436 257 revoked, available at: http://www.european-patent-office.org/news/pressrel/2000_05_11_e.htm

[64] 'EPO upholds decision to withdraw 'free tree' patent: Greens celebrate Neem biopiracy victory', available at: http://www.greens

[65] For an edited version of the petition filed by the coalition of organizations in the US Patent and Trademark office see,TWN report available at http://www.twnside.org.sg/title/Neem-ch.htm Visited 16-1-08

[66] 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.Vandana Shiva, The Neem tree—a case history of biopiracy. TWN website http://www.twnside. org.sg/title/pir-ch.htm

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.'.[67] 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.'[68]

Attacking the claims of novelty,Vandana Shiva asserts that the theory that azadirachtin was being destroyed during traditional processing is inaccurate.[69] The extracts were subject to degradation, but this was not a problem, because the product is used within a few days of production by Indian farmers. 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. Margosan-O is a simple ethanolic extract of Neem seed kernel.[70] 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[71] Existing Neem patents, therefore, 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'.[72]

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 to a person at the time of patenting. An invention is not patentable if the differences between it and the prior

[67] Quoted from TWN website http://www.twnside.org.sg/title/Neem-ch.htm

[68] Quoted from Vandana Shiva, 1999, 'A Case Study of Intellectual Property Rights and Traditional Knowledge', International Conference of the Council of Europe on Ethical Issues Arising from the Application of Biotechnology, 16–19 May, Part 2, vol. 2,p. 244.

[69] Shiva Vandana, *The Neem tree—a case history of Bio-piracy*, (Third World Network YEAR???) Available at <http://www.twnside.org.sg/title/pir-ch.htm> Accessed on???

[70] R.P. Singh of the Indian Agricultural Research Institute in a conversation with Vandana Shiva, cited in Vandana Shiva, Radha Holla-Bhar, Piracy by Patent: The Case of the Neem Tree. Available at http://www. icta.org/doc/shiva%20holla-bhar.pdf

[71] Eugene Schulz, 1992, *Science*, 17 January. Quoted from Vandana shiva, Radha Holla-Bhar, Ibid., p. 152.

[72] Ibid.

art would have been obvious at the time of patenting. Revocation of Patent No. 5124349 (W.R Grace's patent for Neem oil extraction) was demanded 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 indignation in India and many felt that W.R. Grace had claimed as their own, knowledge which belonged to the people of India. An associated fear was also that bringing Neem products and, as a consequence, Neem seeds into the ambit of global market exchange would drive seed prices up, dislocating the traditional balance of exchange and production of Neem and its products. When both the producers and the end users are farmers the dependence on the global trade nexus raises legitimate concerns and fears.[73]

BIO-PIRACY AND KNOWLEDGE RIGHTS

The Neem patents are just one in a large catalogue of genetic resources originating in the global 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 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, 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 obtained by western (mainly North-American) corporations involving some part of the Neem plant 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.[74]

[73] Kadidal, Shayana, 'Subject-Matter Imperialism? Biodiversity, Foreign Prior Art and the Neem Patent Controversy,' 37, *IDEA The Journal of Law and Technology* (1996–97), p. 371.

[74] Regina Jere-Malanda, Biopiracy: Neem, the wonder tree: a classic example of biopiracy from which Africa has a lot to learn is the blatant pirating of the Neem tree, dubbed by the UN as the 'tree of the 21st century'. New African, December,

Neem presents a case of bio-piracy 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

A U.S. based company called Rice Tec Inc., in Alvin, Texas, 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'. RiceTec Inc, was issued the Patent number 5663484 on Basmati rice lines and grains on September 2, 1997 by the USPTO. Rice Tec had been trying to enter the international Basmati market with brands like 'Kasmati' and 'Texmati' with minimal success.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 rice 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'.[75]

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. For instance, only wine of a particular sort, produced in a particular region in France can be signified by the GI name 'Champagne'. Identical wine produced in the U. S cannot be called so; and is termed 'sparkling wine'. Geographic indicators are a useful concept since they protect native wisdom, technologies and traditional efforts from being hijacked. Articles 22–24 of the TRIPS agreement provide for the protection of GI's and prevention of their 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 Basmati patent was revoked in 2001. The Patent Examiner also changed the title of the patent from 'Basmati Rice Lines and Grains'—covering a broad general claim to invention of Basmati, to invention of Basmati to 'Rice Lines Bas867, RT 1117, RT1121' which are restricted to the specific strains bred done by RiceTec.The original patent was open-ended and covered a wide range of plant height, grain size, aromatic quality,

2003.

[75] Quoted from Ted Case studies; Basmati.Available at http://www.american.edu/ted/basmati.htm

including but not confined to the qualities associated with basmati rice. The patent holder now cannot claim the unique qualities of basmati rice nor the unique name 'Basmati'.[76]

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,[77] the 'prior art' clause is recognized if it is described in a 'printed publication'.[78] In this case printed materials were available but not presented. The patent was granted in 1995 on the basis of limited searches for prior art which did not indicate that the claims were apart of public domain.[79] 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? U.S. patent law is criticized for discriminating against developing countries by failing to recognize products like turmeric as 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 patent (US Plant Patent No. 5,751 issued in 1986) granted by the USPTO on a plant species native to the Amazon rainforest, called 'Ayahuasca' and its traditional medicinal uses. 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

[76] For further details on the patent battle see, 'RiceTec Inc. a Texas-based US corporation has lost the Basmati Battle' (Navdanya, August 21, 2001). Available at <http:// www.navdanya.org/news/01august21.htm>

[77] 35 USC Section CHECK INSERTION 102: Conditions for Patentability; novelty and loss of right to patent

[78] Ibid, See 35 U.S.C. Section CHECK INSERTION102 Clause (a)One way it can be proven that an invention is not novel or new, is to show evidence of prior art, orprior 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 to the applicants own foreign patent, or some other persons foreign patent.That stipulation seems unfair on many counts.

[79] US Patent No 5,401,504, Use of Turmeric in Wound Healing (issued 28 march 1995).

was fought only in 1999, after the success of the turmeric case in 1997.[80]

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, in 2001 a New Jersey Comapany, Pure World Botanicals, received a US patent for exclusive commercial distribution of an extract of maca's active libido-enhancing compounds, which it branded as MacaPure.[81] Peruvian officials called the patent an 'emblematic case' of biopiracy. The Peruvian government identified several patents and patent applications relating to 'maca' (Lepidium meyenii), including claims on extracts,[82] 'macamides' and therapeutic methods and uses of the plant.[83] The Peruvian government expressed its concerns about the extent to which patents granted[84] and pending applications in the USA could prevent exports of maca extracts from Peru,[85] and about the recognition of patent rights on genetic materials obtained 'unlawfully, contrary to the specific Decision 391 or even the rules in force for collecting and exporting biological materials.'[86] The Peruvian government stated that seven grounds of 'prior art' and said that the '… one question which arises as a result of the patents analysed is the degree of indigenous knowledge which was used to generate the claimed inventions.'[87] These patents 'are very questionable from a legal point of view.'[88]

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

[80] For details see Glenn M. Wiser, Center for International Environmental Law, November 1999, <http://www.ciel.org/Biodiversity/ptorejection.html> Accessed on ???

[81] US Patent No. 6, 267, 995—Pure World Botanicals Inc. Issued 31 July 2001 for Extract of Lepidium meyennii roots for pharmaceutical applications; US Patent No. 6, 093, 421—Biotics Research Corporation. Issued 25 July 2000 for Maca and antler for augmenting testosterone levels. US Patent Application No. 878, 141—PureWorld Botanicals Inc. Published on 11 April 2002, Compositions and methods for their preparation from Lepidium.

[82] See WIPO, Intergovernmental Committee on Intellectual Property and Generic Resources.

[83] Details compiled from Carlos Correa, 2009, Trends in Intellectual Property and Genetic Resources for Food and Agriculture, Background Paper No. 49, October.

[84] Granted patents include US 6552206, 'Compositions and methods for preparation from *Lepidium*'; US 6428824. 'Treatment of sexual dysfunction with an extract of *Lepidium meyenii* roots'; US 6267995 'Extract of *Lepidium meyenii* roots for pharmaceutical applications'; US 6878731 'Imidazole alkaloids from *Lepidium meyenii* and method of usage'.

[85] According to information supplied by PROMPEX (Commission for the Promotion of Exports), exports of maca have grown from US 1, 056, 287.79 dollars in 1998 to US 3, 016, 240.03 dollars in 2002. Ibid., para 52.

[86] WIPO/GRTKF/IC/5/13, para. 117. In accordance with Peru's submission, '… six of the seven inventors mentioned in the patents of the United States of America and international applications analysed recognize that they obtained dry maca roots from Peruin 1998' (idem. para. 118. X [ii]).

[87] WIPO/GRTKF/IC/5/13, ibid. IX (ii).

[88] Ibid., X (i).

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 US based W.R. Grace & Co. for an insecticide derived from Neem seeds.Turmeric, Basmati are two other well publicized cases where Indian interests have been recognized by courts of other jurisdictions.

Neem, along with Maca,Turneric, Basmati, Ayahuasca, only exemplify a typical story of what has come to be referred to as bio-piracy. 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.'[89] The central criticism in the bio-piracy literature is that the big corporations are freely appropriating bio- diversity and ethno-botanical 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 TIK is appropriated from unprotected commons, repackaged and made 'scientifically tested' and 'commercially accessible', the erstwhile TIK, divested of its essential identity, is claimed as an innovation and then as intellectual property. Critics 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.

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 indigenous biodiversity and indigenous knowledge. Biopiracy thus means not only a resource flow 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 conform to the TRIPS agreement and other patent laws in the West, this ought to constitute 'prior art, prior use, or 'prior Knowledge' .However, in most of the developed nations like United States, prior existing knowledge is only recognized as such, 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 TIK to patenting in non-source countries. In the turmeric and the Neem cases, the two things that

[89] Shiva, Vandana *Biopiracy: The Plunder Of Nature And Knowledge. A New Partnership For National Sovereignty* in Solomaon Tilahun and Sue Edwards eds., (1996 place? PUBLISHER???),p. 62.

resulted in the revoking of the patent was the presence of printed material which was later presented as proof of prior art and the institutional intervention by CSIR in the case of turmeric, and RESTE in the case of Neem. What was in favour of these groups 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, prior art.

The irony here is that India has suffered even though its traditional knowledge, as in China, has been documented extensively. However, 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, 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 1: List of Indigenous Plants of India Which were Patentedin Other Countries

Common name	*Botanical name*	*US Patent No.*	*Patentee*	*Purpose*
Kumari	*Aloe barbadensis*	5652265	Michael Collins	Medicine
Amaltas	*Cassia fistula*	5411733	Toyoharu, Japan	Antiviral
Kala Jeera	*Cuminum cyminum*	5653981	Hilton, USA	Activates immune system

Pomegranate	*Punica granatum*	5411733	Toyoharu, Japan	Antiviral agent
Harad	*Terminalia chebula*	5529778	Surendra Rastogi, India	Ayurvedic importance
Aswagandha	*Withania somnifera*	5466452	Whittle, USA	Skin disorder

KNOWLEDGE AS PROPERTY

TABLE 2: List of Indigenous Plants of India Which were Patentedin US

Company	*US Patent No.*	*Pirated Indigenous Knowledge Related to:*
W. R. Grace 1750 Clint Moore Road Boca Raton, Florida, U.S.A. 33487-2707	[4556562] [4946681] [5124349] [5001146] [5405612] [5409708] [5411736][5397571]	Neem (Hindi); Margosa Tree (Eng.) Azadirachta indica
RiceTec Inc. Schloss Vaduz FL-9490 Vaduz Liechtenstein	[5663484]	Basmati (Hindi & Eng.); Oryza sativa
Sabinsa Corporation 121 Ethel Road West, Unit # 6 Piscataway, NJ 08854, USA	[5536506]	Kali Marich (Hindi); Black Pepper (Eng.); Piper nigrum
Calgene(Subsidiary of Monsanto Co) 800 North Lindbergh Boulevard St Louis, Missouri 63167, U.S.A	[5510255] [547991] [5494790][5538868] [5475099] [5576428] [5558834]	Erand (Hindi); Castor (Eng.) Ricinus communis
Calgene(Subsidiary of Monsanto Co) 800 North Lindbergh Boulevard St Louis, Missouri 63167, U.S.A	[5463174] [5563058] [5512482] [5455167] [5420034]	Sarson (Hindi); Mustard (Eng.) Brsassica compestris
Pioneer Hi-bred / DuPont International Inc., Des Moines, IA, USA.	5638637] [5625130] [5470359]	Sarson (Hindi); Mustard (Eng.) Brassica compestris

Source: Navdanya Website release. <http://www.navdanya.org/earthdcracy/food/letter-biopiracy-and-wto.htm>

Table 1 and Table 2 indicate appropriation of TIK includes patents on uses of Indian medicinal plants such as Kumari (Aloe Barbadenis), 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 (Terminalisa 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), Adarakha (Zingiber officinale), Latjira (Achyranthes aspera), Dhaya (Woodfordia floribunda),

Kathal (Artocarpus integrifolia).[90]

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.[91] 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 withthe maximum number of patents for Indian plants, followed by Japan, Canada, France, Germany and the UK, says Jafri. Other plants patentedby these countries include *arjun, harad, jangli, guruchi, vilayeti shisham* and *chottagokhuru.*

1. Studies have shown that as many as 74 per cent of the plant derived human drugs are used for the same purpose for which native people discovered their use.[92]

2. 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 US $32,000 million per year. Yet developing countries were paid only a fraction of this amount for the raw materials and knowledge they contribute.[93]

3. U.S. imports of Indian medicinal and cosmetic plants equaled US$37.8 million in 2001, one-quarter of total U.S. imports.[94]

4. 25 per cent of US prescription drugs are said to have active ingredients from Indian plants. The sale of these drugs amounted to US $4.2 billion in1980 and US $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 US $70 billion.[95]

5. Dr Vinod Kumar Gupta, who is leading the traditional wealth encyclopedia project and

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[90] Vandana Shiva, et al, *Enclosures and Recovery of the Commons*, RFSTE, 1997.

[91] Ibid; Also see Afsar H. Jafri, People's Commission on Biodiversity, Indigenous Knowledge and People's Rights: A Report (New Delhi: RFSTE).

[92] '*Patents on Neem.*' WHAT IS THIS? ARESEARCH PAPER? REPORT? PRESSRELEASE? SRISTI (Society for Research and Initiatives for Sustainable Technologies and Institutions) Date?. Available at <http://csf.colorado.edu/sristi/papers/patentonNeem. html> Accessed on??.

[93] Author name,'Microbial BioPiracy: Initial Analysis of Microbial Genetic Resources Originating in the South and Held in the North', RAFI's Occasional Paper Series(Place? Publisher?) vol. 1(2) (June 1994), page?;'Declaring the Benefits:The North's Annual Profit from International Agricultural Research is in the Range of U.S $4-5 Billion', vol. 1(3), October 1994. RAFI's Occasional Paper Series, (Place? Publisher?) page??

[94] Finger, J. Michael and Philip Schuler, eds. *Poor People's Knowledge: Promoting IP Is it IP in original?? in Developing Countries* (2004)

[95] Kerry Ten Kate Check Surname, First name and Sarah A. Laird, 'Bio-Prospecting Agreements and Benefit Sharing with Local Communities' in, *Poor People's Knowledge: Promoting IP in Developing Countries,* J. Michael Finger and Philip Schuler eds., (Place???, World Bank and Oxford University Press Year??) p.134. available at <http://www.wds. worldbank.org/servlet/WDSContentServer/WDSP/IB/2004/04/09/000090341_2004 0409102946/Rendered/NDEX/284100PAPER0Poor0peoples0knowledge.txt.> Visited on 1-10-08.

> 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 per cent were plants of Indian origin. By one estimate, a quarter of the new drugs produced in the US are plant-based. [96]

There is, therefore, now undisputed that TIK has immense commercial value. Academic scholarship in this field is replete with examples of the commercial value exploitatively extracted from ethno-botanical 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.[97] After all, TIK enables the first level of selection which indicates the value of a plant/ herb.The resurgence of interest in TIK has ensured that TIK is increasingly becoming the 'technical lead' in bio-diversity 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.[98] 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.

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. The infringement of knowledge rights begins a causal chain which 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 U.S. Patent No. 5,894,079, the 'Enola bean' (yellow bean) patent. The patent was granted to John Proctor, the president ofseed 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.[99] 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 UnitedStates.[100] Because of this bean alone and the threat of being prosecuted for

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[96] Gupta,V.K. 'Documentation of Traditional Medicine Knowledge: Digital Library of India,' Document No. 16, Regional Consultation on Development of Traditional Medicinein the South East Asia Region, Korea, 22-24 June 2005, WHO.< http://www.searo.who.int/LinkFiles/Meetings_document16.pdf > (Accessed 20-1-08).

[97] J. Michael Finger and Philip Schuler,eds., *Poor People's Knowledge: Promoting IP in Developing Countries* (Washington: Oxford University Press, 2004).

[98] Roht-Arriaza, N 'Of Seeds And Shamans: The Appropriation Of The Scientific And Technical Knowledge Of Indigenous And Local Communities,' *Michigan Journal of International Law*, 17 (919) (1996): 919–65.

[99] A Bean of a Different Color', available at <http://www. americanradioworks.org/features/food_politics/beans/5.html> Visited on 25-02- 2002).

[100] Author??? 'The Enola Bean Patent Controversy: BioPiracy, Novelty and Fish and Chips', Available at <http://www.law.duke.edu/journals/dltr/articles/2002dltr0008.html>.Visited on 21-1-08

infringement, some export sales have dropped over 90 per cent, affecting the market for other non-yellow beans, and crucially affecting the farmers producing them.[101]

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 and knowledge affect these farmers? Farmers may be unable to grow the crops they have grown for generations without first paying royalties to patent holders.The extent to which the livelihood of farmers in poorer countries is secured depends in a large measure 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.

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. As negotiations over access and benefit sharing, disclosure clause inclusions dominate the centre stage of issues relating to TIK, the larger question of whose knowledge rights remains unanswered, in fact obscured by the talk on making the TRIPS regime more inclusive of traditional societies. In fact this talk legitimates an ideology which considers private property to be a better preserver and user of global commons. In many locales, the legal status of this ideology is unimpeachable.

A competing ideology, dating back to the Roman Empire, upholds the 'public trust doctrine, that David Takacs draws our attention to.[102] He states that the public trust doctrine preserves traditional ecological/ knowledge system as a value system and an ethic, as its expression in law mutates and evolves. The doctrine, on which environmental human rights and knowledge rights of the traditional indigenous peoples have come to be based, upholds the simple moral principle that it is immoral, and that it ought to be illegal, for private parties to appropriate as property that which commonly belongs to the commons for common health and happiness. What kind of a rights claim does this moral claim translate into? Not all moral claims easily translate into legal rights, for legal inclusions still reflects the primacy of individuated rights which draw sustenance from premises of liberty or utility. This becomes the ideological premise of rights which by definition precludes rights that seem morally inviolable but are legally not cognizable for their collective, non-individualistic, non-utilitarian premises do not conjoin the principles of libertarian rights. Thus knowledge rights of the traditional indigenous peoples are human rights

[101] 'Enola Bean Patent Challenged', available at <http://www.etcgroup.org/article.asp?newsid=96> Visited on 21 January 2008.

[102] Takacs, David, 'The Public Trust Doctrine, Environmental Human Rights, andthe Future of Private Property', 16, *New York University Environmental Law Journal* (2008), p. 711.

but enshrined in instruments of 'soft laws' with obligations that are derogable.

LIMITATIONS OF OVERLAPPING RIGHTS

Intellectual property poses a predicament for knowledge rights of traditional societies—rights which are impossible to distinguish from livelihood rights, environmental human rights, farmers' rights, food security and so on. In upholding the knowledge claims of traditional societies over the modern scientific knowledge claims we need to devise grounds which can enable us to adjudicate between two coequal rights which protect the freedom to pursue and create knowledge. One strategy could be regard both as species human rights, as has been declared by the UDHR and state that the best possible outcome would be afford legal protection to both rights. But this strategy has its pitfalls. Coequal legal status often is not a sufficient condition for equity of outcomes if the right bearers are not coequal. When rights compete, so do the rights bearers and the one who is better endowed, socially and economically, competes better. Rights need able, capacitated vectors or else they fail as justice mechanisms.

The other strategy, and the one I argue in favour of, is to demarcate these rights in terms of the consequences they generate for the right- holders, the biotechnology enabled innovator with IPR protection in one case; and, the traditional communities on the other. Here I am arguing for a priority order to be drawn for rights on the basis of the consequences they generate—a priority order that has a sense of whose interests and what interests are served by a rights regime. The question of whose interests should get priority,) then becomes the basis for adjudication between competing rights. That consequences need to be rights sensitive is the broad utilitarian premise that I have adhered to, in general, in this work. . The estimation what and whose interests the IPR regime is going to serve is an estimation of consequences. There are consequences for innovators in the form of greater profits, and there are consequences for traditional communities which could be in terms of loss of livelihood, subsistence etc.Which right is being served and which infringed ought to be a factor in adjudicating rights. Political morality needs to take cognizance the consequence aspect of rights.

Looking at consequences enables us to evaluate what is being protected. If protecting X right is less important than protecting Y, then regardless of the two rights being coequal the latter ought to be given both moral and juridical preference. What then would make TIK more of an ethical claim than intellectual property? Codified as a knowledge right of traditional communities, it serves as a corollary to the fundamental inviolable right of life. Protection to knowledge, in the traditional community setting, rights clearly determines the extent to which these people enjoy their basic rights to life, health, adequate food and traditional livelihood. Knowledge rights, farmers' rights, ecological rights, all inextricably linked, become aligned with the right to life for their ability to sustain livelihoods and subsistence among poor communities. The value that life attaches to the norms of rights makes life protecting rights non-negotiable.

It is fairly well-established that the intellectual property rules for protecting innovative/creative endeavor poses important challenges for considerations of an appropriate legal framework for the protection of biodiversity, genetic information and associated traditional knowledge. It becomes difficult for the project of universal intellectual property rules to simultaneously be attentive to individual and collective rights; to property and ecological knowledge rights; to act as reward mechanisms and as protectors of sustainable ecological development. Not only do the natures of rights conflict but the nature of rights bearers too preclude easy resolutions of these conflictual demands. Of those challenges, the non-economic values often associated with the protection of animal and plant life, the timeless character of traditional principles that underpin conceptions of ownership, and an entirely different perspective on what constitutes 'property' or 'knowledge' stand out as significant limitations of existing global proprietary schemes. Also, the valuation of intellectual property rights is typically divorced from the substantive principles that govern protection.[103] These inherent tensions reflect themselves in the TRIPS agreement's patentability criteria in article 27 and its sui generis provisions in article 27.3 (b). Article 27.3(b) prescribes a review of itself in regard to the optional exceptions to patentability. This review was to take place four years after the WTO Agreement came into force, the first one falling in 1999

One of the main ideas behind the review provision was to reassess the manner in which TRIPS agreement dealt with the commercial use of TIK and genetic material by those other than the communities or countries where these originate, especially when these are subjects of patent applications. The primary area of concern expressed by developing countries of the South, in the reviews of 1999 and 2003, was about the grant of patents or other IPRs covering TIK without the authorization of the indigenous peoples or communities, who have created, controlled, used and lived in their knowledge systems for centuries, without proper sharing of the benefits that accrue from such use.[104]

At the.WTO Seattle Ministerial Conference for the review of Article 27.3(b) in 1999 several South American countries,[105] together with India, submitted:

> 'given that 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,

[103] Okediji, Ruth L 'Access, Benefit-sharing and the Interface with Existing IP Systems: Is it IP in the original title??? Limits and Opportunities'. International Expert Workshop on Access to Genetic Resources and Benefit Sharing

[104] Refer to Note by the Secretariat.WTO Council for TRIPS on 'The Protection of Traditional knowledge and Folklore'; Summary of Issues raised and points made. point. 2, point No. 7. page??/ 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.

> acquisition, maintenance and enforcement of intellectual property rights, which does not *a priori* exclude any section of the society'.[106]

The need to reconcile provisions of the TRIPS agreement with international treaties and undertakings like the CBD, International Undertaking on Plant Genetic Resources, the model law of the Organization of African Unity (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.[107] Several 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 bio-piracy and protection of traditional knowledge. It also brought into focus the limitations of the prior art/ use clause which 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. Often TIK exists only in oral form or, if documented, is available in languages that the patent authorities are not familiar with. The language barrier could lead to insufficient screening for prior use. It could also mean 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.

Development of databases on traditional knowledge would help resolve this problem, at least partially. Documentation, as has been attempted by Traditional Knowledge Digital Library (TKDL) 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. [108] Oral traditions

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[106] India, IP/C/M/28, para. 128. WHAT were the Submission Document Titled? Dated?

[107] EC, IP/C/M/35, para. 238-9, IP/C/M/30, para. 145.

[108] Initiatives have taken in India to document the wealth of its traditional knowledge heritage in a format recognizable and accessible by the international IP 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

however, would continue to remain vulnerable.

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? What is being argued here is that the issue of patenting and the threat it poses to traditional knowledge ought not to be only a matter of whether a patent has been successfully challenged, revoked or not, or whether there is ample protection through documentation of various traditional knowledges, whether there are sufficient disclosures and whether norms of equitable benefit sharing have ensued from disclosures. Rights have different sticks in their bundle, some being more important than others. The unimportant sticks of the bundle lack the power to exclude. For example, the right to benefit sharing does not exclude bio-prospectors from sourcing genetic resources and knowledges from the traditional communities. It simply makes the community in question a claimant of some compensation. Similarly disclosures, which are a necessary prelude to benefit sharing, does not foreclose a patent claim. Again it merely makes the distributional chain of benefits a condition for claiming patents.

Alternatively establishment of prior art could lead to a revocation of patent claims as was the case with Neem and Turmeric. The challenge to a patent (pre or post grant) is a costly and an intricate 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. 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.

Sui generis legislation and 'benefit sharing' are good examples of the strategy of overlapping rights that has evolved from TRIPS agreement, albeit indirectly through other instruments such as the CBD and FAO (IBenefit sharing is a form of monetary compensation for the use of local people's knowledge.[109] 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

remained to be included and expected to be included by December2007. Source??

[109] 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'. SOURCE?

local people do not have intellectual property rights over their knowledge and that a monetary reward constitutes a sufficient compensation. Benefit-sharing supports the idea that the knowledge of farmers and local communities is not disposed towards fulfilling patenting criteria.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.

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 currently employed protective mechanisms grant the TIK holder:

1. A right to challenge a patent claim through demonstration of prior art.
2. The ability to induce disclosures, again based on the demonstrable proof of its prior existence.
3. A right to benefit sharing based on disclosures.

Once proof is demonstrated it places certain obligations on part of the patent holder. The primary right holder is then the patentee who, in some conditions, has a duty towards the original knowledge or resource holder. The duty 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 without downstream compensation for use.

Post/pre grant opposition, disclosure requirements, benefit sharing mechanisms are not aspect of traditional resource rights (TRRs); they function more like aspects of intellectual property rights which disburse benefits of successful intellectual property claims. These rights are to use Becker's classification, a secondary right 'which are entailed by the existence of another right, and is extinguished when the primary right is extinguished'.[110] They are together at best a specification of the conditions under which the patent holder's rights claim may be said to be sound and justified or may be justifiably overridden or may obligate him to share profits with the community of origin. It does not specify the conditions under which the traditional knowledge holder may claim his right—a right which says that this is ours and we refuse to part with it, 'benefits' notwithstanding.

Access and benefit sharing mechanisms and residuary rights are akin to, to use Rosemary Coombe's phrase in the context of TIK assertions and struggles, 'neo-liberal spaces of governmentality'.[111] They do, as she asserts, 'endow some social groups with new forms of

[110] Becker, Lawrence C., *Property Rights, Philosophical Foundations* (London:RKP, 1977), p. 7.

[111] Rosemary Coombe,Intellectual Property in Regimes of Neoliberal Governmentality:Locating Community Subjects and their Traditions. Submitted for inclusion in Mario Biagioli, Peter Jaszi and Martha Woodmansee, eds., *Contexts of*

negotiating skills […] provide opportunities to assert new kinds of rights and to interpret universal rights through the lens of vernacular practices, obligations, commitments, and aspirations'. However, as they afford spaces of negotiation for rights and benefits (more like rights to benefits) they also further reinforce market subjectivites and global networks of influence.

The moral claim ofTIK rights has not translated into legal claims within TRIPS agreement. Claims of benefit sharing have been acknowledged by TRIPS (for instance by the Doha Declaration) but these are conceptualized in a manner that they enable the Intellectual Property system. Even as they run alongside CBD, and 'share benefits' or 'disclose origins', their abiding commitment remains the protection of intellectual property. In a sense then, TIK never evolves into counter rights claim which have the sustained capacity to deter infringements. Community property rights, traditional resource rights, community knowledge rights lack the legal power and juridical status that make them coequal to intellectual 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!'[112]

HUMAN RIGHTS AND INTELLECTUAL PROPERTY

Since the adoption of the UDHR in 1948, intellectual production has been considered a fundamental human right of all peoples.[113] The relationship between human rights and contributions to knowledge is however arguably controversial. The International Covenant on Economic, Social and Cultural Rights (ICESCR) is in many ways the most crucial international instrument through which the relationship between the two can be examined.[114] On the one hand it recognized the rights to self determination (article. 1) food and clothing (article 11art11), work (article 6), physical and mental health (article12) as fundamental human rights. The common feature of this cluster of rights is the right to '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 articulated in the form endorsed by the TRIPS regime.

Invention (University ofChicago Press).

[112] Feinberg Joel 'The Nature and Value of Rights' in *Rights* ed. Carlos Santiago Nino (NY: New York University Press, 1992), p. 194.

[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>.

[114] Article 15 International Covenant on Economic, Social and Cultural Rights <http://www.unesco.org/education/information/nfsunesco/pdf/SOCIAL_E.PDF>

The notion of knowledge as a human right may be appropriated as a justificatory premise for the claim of intellectual property rights. The right of the techno-scientific community to the fruits of their labour becomes a powerful argument for libertarian rights but as human rights claims they falter. Firstly, unlike most human rights instruments they are not vitally linked to the protection of 'human condition'. The essence of human condition is an important baseline for the instrumentality of human rights. intellectual property rights, as mentioned earlier, as reward mechanism and an economic entitlement. They are bereft of the 'life' connection that most human rights link up with.

Secondly, because western intellectual property 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, knowledge production is a means of developing and maintaining group identity and survival, rather than promoting individual economic gain.The emphasis of the existing western intellectual property rights regime on individual proprietary rights does not address the collective nature and the essentiality of traditional knowledge. intellectual property rights raise a number of concerns with regard to their impact on the realization food, health and livelihood of traditional communities. 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. Some knowledge rights, that is, . those that are linked to issues of survival, food security, livelihood rights, ecological sustainability etc. have an unquestioned claim as a human right, while for intellectual property rights the claims are questionable and contestable on moral grounds. I make the a crucial distinction between the knowledge rights of the traditional peoples and the knowledge rights in the form of IPRs to draw out distinction between two co-equal rights, in the absence of which one right struggles for content and space.

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 western 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.

It is important to draw this distinction between the two knowledge rights in question so as to make a larger point. 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.

Key arguments in this paper also suggest 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, essentailized and singular notions of science and its projects. It has led to a fundamental questioning of the foundational principle of IPRs—the idea of scientific rationality. A regime like intellectual property rights are enwrapped in the terms of modern expert science. This, as a number of critics have pointed out,[115] 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 proposal stated: '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.'[116]

Science and technology studies 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'.[117] 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,

[115] P. Caplan, (ed.), *Risk Revisited* (London:Publisher? 2000); Pluto; B.Wynne,'May the Sheep Graze Safely?: A Reflexive View of the Expert-Lay Knowledge Divide,' in, *Risk, Environment and Modernity:Towards a New Ecology,* S. Lash, B. Szerszynski and B.Wynne eds.,(London: Sage Publications, 1996).
[116] 3 Nov 1999 Reference: IP/C/W/165 Give details of International docs, name, sourceetc.
[117] Durkheim E., Selected *Writings,*, [1899] A Giddens. ed. and transl. (Cambridge: Cambridge Univ. Press, 1972).

suspect.[118] 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' versus 'non-scientific'. The traditional comes to be seen in this context as local and pre-scientific, and the techno-scientific as the sole repository of rational ideas for progress. In offering protection to one kind of knowledge system, the TRIPS framework reinforces the binaries of epistemic projects.

TIK stands in complete contrast to western modern sciences, in terms of conceptualizations, the residential and proprietary status, generation and communication. It encompasses the beliefs, 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 TIK as base data and information, are attempts to assimilate TIK in terms and forms that are commercially and globally acceptable and viable. These framings essentially 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 legally recognize), 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.

Cases of appropriation of traditional knowledge by way of patents which are granted on derived applications are numerous, as enumerated. 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 developments121 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 and which do not run contrary to the fundamental principles that govern the notion of intellectual property rights. In a way, attempts at democratization of the intellectual property regime shifts attention from the innate confrontation between

[118] See, Brokensha D.W. et al (eds.) *Indigenous Knowledge Systems and Development* (Lanham: University Press of America, 1980);. Escobar,A, *Encountering Development: The Making and Unmaking of the Third World* (Princeton: Princeton University Press, 1995); Fairhead, J. and M. Leach, *Reframing Deforestation: Global analyses and local realities—Studies in West Africa* (London: Routledge, 1998);

individualized intellectual property rights and community rights over knowledge resources embedded within the very notion of intellectual property rights.