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Climate Change Mitigation and Adaptation: What is the Role of Intellectual Property and Traditional Knowledge?

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As human activity caused the problem
so too can human activity find the solution

Francis Gurry, Director General,
World Intellectual Property Organization[1]

Abstract

Climate change has been described as the leading human and environmental threat of the 21st century. Premised on the traditional role of intellectual property law, namely to encourage human inventiveness through the grant of (limited) proprietary rights in the form of patents, trademarks, trade secrets and plant breeders' rights, among others, this paper focuses on the role of intellectual property law and policy, particularly patents and protection of traditional knowledge (TK), in climate change mitigation and adaptation.

Essentially, three main questions are addressed: 1. What is climate change? 2. What are the relevant technologies for mitigating, and adapting to climate change? 3. What role can intellectual property law and protection of traditional knowledge play in dealing with climate change? The authors opine that intellectual property right instruments can play an important role both locally and internationally in the on-going attempts to both cope with and grapple with climate change.

This would happen through the grant of intellectual property rights over traditional knowledge (TK). This is important because TK constitutes im-

1 Message from Francis Gurry, director general, World Intellectual Property Organization (WIPO), World Intellectual Property Day 2009, available at http://www.wipo.int/ip-outreach/en/ipday/2009/dg_message_09.html, last accessed 20 April 2013.

portant practices for addressing climate change, especially in the developing world where the vast majority of indigenous communities live. If such status is granted to TK, indigenous communities would be empowered through the financial incentives obtained in the form of royalties and other benefit-sharing schemes to better adapt to climate change. Among others things, they would be able to enhance that knowledge.

A. Introduction

Climate change refers to a build-up of human-induced atmospheric greenhouse gases (GHGs) such as carbon dioxide gas (CO_2), resulting from the use of hydrocarbons or fossil fuels (coal, petroleum, and natural gas) mainly for industry and motor transportation.[2] The building-up of such gases or the greenhouse effect, results in (among other climatic changes) an increase in the levels of heat in the world, or global warming.[3]

The Intergovernmental Panel on Climate Change (IPCC)[4] estimates that the mean global surface temperature has increased by about 0.2 to 0.3 degrees Celsius over the last 40 years.[5] The problem is aggravated by the increasing loss of forests, which act as 'carbon sinks' that absorb gases and prevent their release into the atmosphere.[6]

As a result of global climate change, many people, especially those in developing countries, suffer from prolonged droughts, frequent floods and

2 For introductory notes on climate change, see among others, UN (2007); Philander (1998); Grantham Institute for Climate Change (2007).

3 Contrary to popular opinion shaped by the media, global warming is not the only effect of climate change. Indeed the two terms are not interchangeable. See Parliament of Australia, *Climate Change and Global Warming – What is the Difference?*, available at http://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Browse_by_Topic/ClimateChange/theBasic/climate, last accessed 20 April 2013.

4 The Intergovernmental Panel on Climate Change (IPCC) is an international think tank established in 1988 by the World Meteorological Organization and the United Nations Environment Programme to assess the "risk of human-induced climate change". Its reports are highly influential in forming national and international responses to climate change. See http://www.ipcc.ch/, last accessed 20 April 2013.

5 IPCC (2007).

6 Recent findings suggest that loss of natural forests around the world contributes between 10 and 25% of global greenhouse gas emissions, a rate higher than that of the transport sector. See Fry (2008).

intensified human-wildlife conflicts over natural resources such as water.[7] Developing countries, including small islands, will be severely affected by climate change than the rest of the world.[8] The IPCC describes Africa as "more vulnerable" to the impacts of climate change "because of factors such as widespread poverty, recurrent droughts, inequitable land distribution and over-dependence on rain-fed agriculture".[9]

Effects of climate change are also evident, albeit less severely, in developed countries. The Supreme Court of the United States of America, in the first climate-change-related court case brought before it in 2007, ruled that "…the rise in sea levels associated with global warming has already harmed and will continue to harm Massachusetts."[10]

The two main international legal instruments related to climate change namely the United Nations Framework Convention on Climate Change, (UNFCCC)[11] and the Kyoto Protocol to the UNFCCC[12], strive to ensure a decrease in the release of GHG from anthropogenic activities and to protect the world's rain forests.[13]

In order to achieve the goal stated above, technologies are required. In light of this fact, the UNFCCC sets obligations for developed countries to facilitate technology transfer to developing countries where they are most needed.[14] The next part of this essay highlights legal aspects of potential technologies for climate change adaptation and mitigation. Part three proceeds to show how patent law doctrines can be used to encourage reduction of anthropogenic emission of greenhouse gases. Part four departs from 'conventional' intellectual property (IP) and discusses the importance of preserving traditional knowledge for sustainable development and climate

7 IUCN (2008).
8 (ibid.).
9 IPCC (2001).
10 *Massachusetts v Environmental Protection Agency* (2007), United States Supreme Court 2 April.
11 United Nations Framework Convention on Climate Change, 9 May 1992, entered into force 21March 1994, 31 International Legal Materials (I.L.M). 849.
12 Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 10, 1997, 37 I.L.M. 32.
13 The Kyoto Protocol, for example, requires "Encouragement of appropriate reforms in relevant sectors aimed at promoting policies and measures which limit or reduce emissions of greenhouse gases not controlled by the Montreal Protocol". See Article 2vii.
14 See UNFCCC Articles 4.3 and 4.5 related to financing and technology transfer.

change mitigation among local and indigenous communities. Part five concludes this essay with a call for intellectual property professionals, including scholars and inventors, to ensure that climate change mitigation and adaptation strategies are entrenched in day-to-day agendas. 'Business as usual' is no longer the way to go.

B. Green Innovations: Potential Technologies for Climate Change Mitigation and Adaptation

The phrase 'green innovation' has become a buzzword for industries and businesses, including those obviously involved in GHG-emitting activities.[15] In this paper, the phrase refers to technologies that reduce emission of greenhouse gases and/or minimise harmful effects of GHG already emitted.[16] The key functions of such technologies are mitigation and adaptation.[17]

Potential options for reducing emission of carbon dioxide gas and enhance sinks of GHG include "reducing energy consumption, switching to less carbon-intensive fuel (e.g. coal to gas), increased use of non-carbon fuels (hydro, renewable, and nuclear), carbon capture and storage (CCS) and biological sequestration of carbon.''[18]

We now describe some these technologies, albeit briefly, in order to place intellectual property law and policy discussions in the right context.

I. Reducing Energy Consumption

Energy is essential in our daily lives: "We rely on energy for heating, cooling, cooking, transportation, and manufacturing and for running our factories,

15 Many TV commercials claim such businesses promote 'eco solutions' in products ranging from construction of oil and gas pipelines to the manufacture of sports cars.

16 A good example of the latter is carbon capture and storage CCS, explained in Section B. III below.

17 The IPCC defines 'mitigation' as an anthropogenic intervention to reduce the sources or enhance the sinks of GHGs, and 'adaptation' as an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects. See IPCC (2007).

18 Bankes & Roggenkamp (2008).

homes and hospitals."[19] Our lives would be seriously impaired and many of our social and economic activities would come to a standstill without energy. It has been argued that energy forms part and parcel of the right to development.[20] Since we cannot do without energy and because, at the moment, energy production is largely dependent on fossil fuels, new technologies are needed to reduce the amount of energy we consume. The airline industry, for example, has been named as one of the main sources of GHG emissions. It is estimated, for example, that a return flight from London to New York contributes up to 2,259 tons of carbon dioxide gas emissions per passenger.[21] To reduce the number of 'love miles'[22], it is necessary to invest in information communication technologies that would enable or facilitate interaction between people without their having to meet physically. E-conferencing, for example, can replace a number of academic and business trips around the world.[23]

II. Switching to Less Carbon-intensive Fuel and Use of Renewable Energy

As a result of global climate change, many governments around the world have come up with policies that promote the use of renewable energy, such as biofuels. Owing to the incredible amount of attention biofuels have attracted from policy makers[24] and the relationship these fuels have with the welfare of indigenous people and other holders and custodians of traditional knowledge, this subject deserves a few more lines in this essay.

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19 Zillman et al. (2008:3).

20 The UN Sustainable Development Division can provide this in no clearer manner: "Energy is central to achieving sustainable development goals. Some two billion people have no access to modern energy services. The challenge lies in finding ways to reconcile this necessity and demand for energy with its impact on the natural resource base in order to ensure that sustainable development goals are realized.".

21 Several websites assist passengers to calculate the amount of carbon dioxide gas they emit during their travels. This calculation is based on www.myclimate.org, last accessed 20 April 2013.

22 This term is used by a renowned United Kingdom journalist and climate change activist George Manbiot to describe family-related 'jetting'. See Monbiot (2006:39).

23 For a dissenting opinion, see Stein (2009), who declares: "Technology is wonderful and indispensable. But for finding out the tricks of the trade, the way business runs in bad times and good, the latest developments in business and the economy, nothing can replace the spark of intelligence that travels from person to person at meetings."

24 Peters & Thielmann (2008). See also JRC (2007).

The word biofuels refers to the liquid, solid or gas fuel derived from biomass, either from recently living organisms or from their metabolic waste.[25] Common examples of biofuels are ethanol, methanol and biodiesel.[26] Ethanol alcohol can be obtained by fermentation of sugar crops such as sugarcane, sugar beet and sweet sorghum, or of starchy crops such as corn and cassava.[27] Methanol can be obtained from wood or woody crops by means of a wood gasification process followed by compression and methanol synthesis.[28] Biodiesel fuel, on the other hand, can be obtained from oil crops, such as soybean, rapeseed, sunflowers and palms, by "extracting the oil with suitable solvents or through mechanical pressing and then converting the oil into diesel fuel by a transesterification process".[29]

Research into production and markets in biofuels has grown tremendously in the past ten years, following the express interest in this type of renewable energy by industrialised countries – notably the United States and the European Union.[30] The United States for example, has indicated that it will support the use of biofuels as the main way of combating climate change.[31]

Although these efforts and the underlying policy commitments are indeed commendable, many people are sceptical about biofuels. Biofuels are widely linked to the rising food prices,[32] environmental degradation[33] and land tenure conflicts[34] in developing countries, where investors from industrialised countries are eager to buy land and maximise what they perceive as

25 For further information see World Business Council for Sustainable Development at www.wbcsd.org and http://corporateeurope.org/publications/eus-agrofuel-folly, last accessed 21 April 2013.
26 Giampierto et al. (1997a).
27 (ibid.).
28 Ellington et al. (1993).
29 Shay (1993). See also Giampierto et al. (1997b).
30 CEO (2007).
31 The Renewable Fuels Standard (RFS) requires the use of 28.4 billion litres of biofuels in the country by 2012. World Watch Institute (2006).
32 The World Bank estimates that food prices have increased by 83% in the last three years. See World Bank (2008). According to Oxfam, 30% of such increase is attributable to biofuels. See also Oxfam (2008).
33 As a result of the biofuels boom, forest clearing has taken place on an unprecedented scale around the world. See Wakker (2005).
34 According to the United Nations Permanent Forum on Indigenous Affairs (UNPFIA), sixty million indigenous people may be displaced by biofuels. See Biofuelling Poverty: Why the EU renewable-fuel target may be disastrous for poor people available at www.oxfam.org.nz/imgs/PDF/Biofuels%20briefing%20note, last accessed 20 April 2013.

an emerging business opportunity. This, in turn, impacts rather negatively on national and international efforts to protect traditional knowledge, as will be expounded later in this essay. New technologies are needed in order to minimise these conflicts, rather than solving one problem by causing a new one.[35]

III. Carbon Capture and Storage and Biological Sequestration

Carbon capture and storage (CCS) is a technology whereby carbon produced by different sources is captured, transported and stored or sequestrated in a reservoir where it does not easily leak and cause atmospheric build-up of GHG.[36] There are three types of carbon sequestration: geological, oceanic and biological carbon sequestration. Biological sequestration involves taking up of CO_2 in forests and soils.[37] While the first two involve application of technology, the latter is considered 'natural' in the sense that forest or soil naturally takes up the CO_2.[38] Reducing emissions from deforestation and forest degradation (REDD) is a concept born out of this mitigation strategy. It is an innovative way of encouraging forest conservation through financial incentives regulated at the international level.[39] REDD is an important entry point into an inquiry on the relationship between indigenous peoples and climate change mitigation. Local and indigenous peoples are not only custodians of major forests around the world, but also eke their living directly from the natural environment.

The importance of investing in R&D for CCS technologies cannot be over-emphasised. At the moment, the answers to many questions on side effects of CCS remain unknown, making it difficult for the technology to be used, especially in developing countries. The United Republic of Tanzania in East Africa, for example, has issued a statement rejecting CCS-sponsored

35 Other renewable energy sources not discussed here include nuclear, wind, geothermal and solar.
36 For a very informative article, see Bankes & Roggenkamp (2008).
37 Purdy & Macrory (2004:2).
38 (ibid.).
39 As natural as REDD is, technology is still needed to reduce poverty and firewood dependency among local communities in developing countries.

projects until side effects are scientifically established.[40] Venture capitalists and entrepreneurs wishing to invest in R&D for CCS need to be sure of strong protection for their intellectual property rights. This is one way that intellectual property law and policy can play a role in climate change mitigation and adaptation, as will be expounded in part two of this essay.

IV. Agricultural and Pharmaceutical Innovation

Climate change has had and will continue to have a devastating impact on agriculture.[41] Developing countries whose economies depend upon (rain-fed) agriculture will bear the burden rather heavily. Crop yield for maize, the staple food in Africa, for example, is expected to drop by 55% in 2020.[42] Food insecurity will lead to economic hardship, wars and an upsurge of refugees. Worse still, climate change is also associated with the emergence of diseases hitherto unknown to mankind or 'globalising' diseases which were known to exist only in certain parts of the world[43]. To enable communities in developing countries to adapt to these new challenges, cutting edge technologies are needed that will boost agriculture and treat diseases. Both plant and pharmaceutical products enjoy intellectual property rights protection of one form or another throughout the world. The question is: Can such protection be of help to climate change mitigation and adaptation? The next section attempts to answer this question.

40 See Carbon Offsets Daily, *Tanzania Says No to International Project on Carbon Capture, Storage,* available at http://tinyurl.com/pdnkwz, last accessed 12 August 2009.

41 See, for instance, an illustration provided by the University of Reading, *Climate Change & Agriculture*, available at http://www.ecifm.rdg.ac.uk/climate_change.htm, last accessed 13 August 2009.

42 See All Africa, *Africa: Climate Change Threatens Food Supply, G8 Warned,* 7 July 2009, available at http://allafrica.com/stories/200907070060.html, last accessed 15 August 2009.

43 Godoy (2009).

C. The Role of Intellectual Property Law and Policy

Intellectual property law awards inventors and artists (limited) exclusive rights to control the distribution, use and licensing of their inventions.[44] The main justifications for the award of Intellectual Property Rights (IPRs) are utilitarianism and the right to the fruit of one's labour, based on [the] Lockean theory.[45] It is generally agreed that protection of IPRs encourages innovation especially in the field of industrial property.[46] Can this 'traditional' role be extended to climate change mitigation and adaptation? To answer this question we discuss mainly patents and, albeit in passing, other forms of IPRs and technology transfer.

I. Patents

A patent is a limited monopoly granted in exchange for the disclosure of technical information.[47] This property right enables the patentee to control the way the invention is exploited.[48] The United States Patent Act provides explicitly that patents "exclude others from making, using or selling the invention."[49] This rather strong 'monopoly' has arguably encouraged creativity and the progress of science and technology for centuries.[50]

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44 Van Caenegem (2003:250).

45 See Hughes (1988).

46 This 'utilitarian' justification for IP remains one of the cornerstones of the current IP system.

47 Bently & Sherman (2004).

48 In order to have a patent issued to him, a patent applicant is required to disclose his invention clearly enough for a person having ordinary skill in the art PHOSITA to use it. This information is made accessible to the general public. This has also been referred to as a 'social contract'.

49 35 U.S.C. 1 154 (1988).

50 This historical role is well captured in the popular quote of Abraham Lincoln, "Next came the patent laws. These began in England in 1624, and in this country with the adoption of our Constitution. Before then any man [might] instantly use what another man had invented, so that the inventor had no special advantage from his own invention. The patent system changed this, secured to the inventor for a limited time exclusive use of his inventions, and thereby added the fuel of interest to the fire of genius in the discovery and production of new and useful things.", text quoted from http://www.todayinsci.com/L/Lincoln_Abraham/LincolnAbraham-Quotations.htm, last accessed 13 May 2013.

Patent law has attracted the lion's share of criticism for the prevailing environmental pollution and degradation. This is probably due to the fact that, in essence, there is no distinction given between a 'green' and a polluting invention.[51] In an explorative and philosophical article on the role of patents in the protection of the environment, Derclaye opines that:[52]

> … patent laws as engines driving technological advance are responsible for the impact patented inventions have on the environment …. If technological progress had not been encouraged by patents then less (no additional) environmental damage would have occurred.

While we do not agree with the above 'verdict', we believe that if patent law is responsible for the current state of affairs (a contribution in the larger box of anthropogenic or man-induced climate change), it can also be a part of the solution for climate change mitigation and adaptation. There are four main ways in which patents can address anthropogenic emission of GHG and other environmental concerns. The first is the traditional role of encouraging inventiveness through the grant of proprietary rights.[53] Viewed in a positive manner, patent law has always been doing this, albeit in a small scale. It is opined that if patents are granted to inventors of technologies, as discussed above, the role of patent law in climate change adaptation and mitigation will be fulfilled.[54]

The second way in which patent law may be of help is through the morality and *ordre public* provisions typical of the European Patent Convention EPC.[55] The *ordre public* provision, whose origin is said to be the French Civil Code[56], has no equivalent in the United States Patent law.[57] Nevertheless, the Trade Related Aspects of Intellectual Property (TRIPS) Agreement

51 All inventions are subject to the same rigorous patentability criteria.
52 Derclaye (2009).
53 Admittedly, this may sound simplistic, because of the negativity already associated with the role of patents in encouraging "polluting inventions". However, all factors remaining constant, meaning if society is itself motivated to invent eco-technologies, patent offices will open the doors and encourage such action.
54 However, this may not satisfy critics of the patents system, who would wish for a complete revamp of the system. Their criticisms range from patenting 'life forms' to environmental degradation.
55 See Article 53(a) of the European Patent Convention.
56 Armitage & Davis (1994), cited in Derclaye (2009), note 51.
57 (ibid.).

contains the following (non-mandatory) provision on morality and *ordre public*:[58]

> Members may exclude from patentability inventions, the prevention within their territory of the commercial exploitation of which is necessary to protect *ordre public* or morality, including to protect human, animal or plant life or health or to avoid serious prejudice to the environment, provided that such exclusion is not made merely because the exploitation is prohibited by their law.

It is the authors' opinion that the phrase *to avoid serious prejudice to the environment* fits in the climate change discourse as climate change is a serious environmental concern. However, the difficulty with this provision lies not only in what *ordre public* really means, but also on how to identify inventions which are not within the *ordre public* threshold.[59]

Thirdly, patent information provided to patent offices and open to the public, can be used by environmental regulatory authorities to discover technologies which are potentially harmful to the environment and therefore deny relevant rights to use.[60] It is worth emphasising that the granting of a patent does not give a person positive rights to use a particular invention. The role of intellectual property law should not be confused with that of, say, environmental law. In the words of leading IP scholars, "each area of law has a discrete and separate function which it should pursue and, correspondingly, that it is wrong for these functions to be confused or conflated."[61]

58 Article 27(2) of the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS).

59 Citing case T 19/90, *Onco-Mouse,* Derclaye (2009) provides that "Even if it might be difficult to judge whether an invention is immoral or contrary to *ordre public* the European Patent Office (EPO) agreed that it will nevertheless do so". This is encouraging and it is submitted that the more applications opposing grant of patents, (say by environmental NGOs) the more likely it is to get an EPO jurisprudence with regards to ordre public and environmental conservation.

60 This can be seen as a reactive rather than a proactive approach, but nevertheless it is a more practical approach than the desire for a revamp of patent law.

61 Sherman & Atkinson (1991), cited in Derclaye (2009).

Lastly, patent law can be tailored to provide for special treatment to green inventions. This can be through extending time of protection[62] or relaxing patentability criteria, such as novelty.[63] When all is said and done, patent law can still be explored to find other windows of opportunity to address climate change issues.[64]

II. Other IPRs and Technology Transfer

Not all technologies are protected by patents. Confidential information, trademarks, plant breeders' rights and other industrial property instruments complement patents in promoting inventiveness. Plant-related inventions, for example, do not attract patent protection in all countries. Plant breeders' rights are granted in the place of patents to encourage innovation and private investment in R&D for plant genetic resources for food and agriculture. The role and interdependency of various forms of IPR cannot be summed up more clearly than is done here by Francis Gurry, World Intellectual Property Organisation (WIPO)'s director general:[65]

> On World IP Day 2009, the World Intellectual Property Organisation highlights the contribution of a balanced intellectual property system to stimulating the creation, diffusion and application of clean technologies; to promoting green design, aimed at creating products that are eco-friendly from conception to disposal; to green branding, helping consumers make informed choices and giving companies a competitive edge.

Irrespective of an IPR used, it is essential that such a monopoly does not prevent technology transfer especially to developing countries. Technology transfer involves enabling countries with a less effective scientific base to

62 Supplementary protection certificates for medicinal and plant protection products offered in Europe are a good example. See Regulation No 1768/2 of 18 June 1992 concerning the creation of a supplementary protection certificate for medicinal products, 1992 OJ EC L 182/1 and Regulation No. 1610/96 of the European Parliament and Council of 23 July 1996 concerning the creation of a supplementary certificate for plant protection products, 1996 OJ EC 198/30.

63 It is less complicated to amend existing patent laws to this effect than, say, to wait for patent offices to play trial and error to identify inventions contrary to *ordre public* in environmental terms.

64 This article does not attempt, nor can it claim, to be exhaustive on the subject.

65 Message from Francis Gurry, director general of WIPO, note 1. In this paragraph the role of design law, trademarks and patents is clearly highlighted.

acquire modern technologies that enhance their environmental protection, while promoting sustainable development.[66] The Kyoto Protocol contains explicit provisions on technology transfer. It provides, *inter alia*, that:[67]

> All Parties, taking into account their common but differentiated responsibilities…shall…
> (c) Cooperate in the promotion of effective modalities for the development, application and diffusion of, and take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies, know-how, practices and processes pertinent to climate change, in particular to developing countries, including the formulation of policies and programmes for the effective transfer of environmentally sound technologies that are publicly owned or in the public domain and the creation of an enabling environment for the private sector, to promote and enhance the transfer of, and access to, environmentally sound technologies

From the provision above, one can note that IPRs do limit technology transfer between the global north and developing countries. The fact that technological know-how relevant for climate change mitigation is protected by patent, for example, makes it difficult for any international agreement to interfere with private property rights of the firms holding patents for such technologies. The way out of this difficulty sometimes opted for by developing countries, and which does not help much either in facilitating technology transfer, is issuance of compulsory licenses.[68] Some of the grounds for issuance of a compulsory license are public health and national emergence. Environmental concerns rarely, if ever, meet this threshold. It would be quite difficult, for example, for an African or Asian country to issue a compulsory license for the use of technology to protect the ozone layer.[69]

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66 See Anderson (2003:2), who suggests that the term technology transfer "… is sometimes used to refer the transfer of up-to-date technology and products from advanced, industrial nations to poorer countries, sometimes on preferential financial terms and with a view to enabling the poorer countries to take advantage of modern techniques for producing goods and services".

67 The Kyoto Protocol to the United Nations Framework Convention on Climate Change, 3rd Session. Dec 11, 1997 37 ILM 32 (1998). See Article 10 (c).

68 Simply defined, a compulsory license is the authorisation given by a judicial or administrative authority to a third party for the use of a patented invention, without the consent of the patentee, on various grounds of general interest. See, generally, Correa (2000).

69 This is neither a national emergency, nor a public health concern. Bird flu (Avian influenza) and HIV/AIDS are the two areas that are convincingly significant enough to prompt the issuance of a compulsory license on the grounds of both emergency and public health.

This difference in priority calls for developed countries, which have contributed more to the current state of global climate change, to take the matter seriously and ensure that technology transfer agreements empower developing countries for climate change mitigation and adaptation.[70] In the same manner, traditional knowledge of local and indigenous communities must be respected, protected and promoted for sustainable development and climate change mitigation and adaptation. The next part of this essay elaborates on this conception.

D. Climate Change and Traditional Knowledge

Climate change is a matter of life and death for local and indigenous communities.[71] This is not only because adaptation techniques as described above require economic and technological ability, which is lacking among poor and marginalised communities, but also because mitigation strategies currently in place by and large militate against the rights and welfare of indigenous peoples. It is widely reported, for example, that local and indigenous communities around the world are being evicted from their ancestral territories to give room for the implementation of the Kyoto Protocol's Clean Development Mechanism.[72] In the next part of the essay we show why traditional knowledge matters for climate change mitigation and adaptation and how to go about protecting such knowledge for sustainable development and biodiversity conservation.

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70 The UNFCCC applies the doctrine of 'common but differentiated responsibilities' to show that developed countries ought to do more to harness the situation.

71 A recent report issued by the Interagency Support Group on Indigenous Issues provides, *inter alia*, that "the most advanced scientific research has concluded that changes in climate will gravely harm the health of indigenous peoples[']traditional lands and waters and that many of [the] plants and animals upon which they depend for survival will be threatened by the immediate impacts of climate change." See http://www.un.org/esa/socdev/unpfii/en/climate_change.html, last accessed 12 September 2009.

72 In many countries indigenous peoples' traditional rights to land are not protected by law. As a result, governments can use their fiat to evict such communities for what they call 'public interest', which is often in fact 'investors' interest'.

I. Why Traditional Knowledge Matters

The WIPO describes traditional knowledge as tradition-based literary, artistic or scientific works, performances, inventions, scientific discoveries, designs, marks, names and symbols, including also undisclosed information, and all other tradition-based innovations and creations resulting from intellectual activity in the industrial, scientific, literary or artistic fields.[73] TK is the totality of knowledge of local and indigenous communities that enable them live in harmony with the environment while supporting their livelihoods. This knowledge is termed traditional not because it is old, but because it is "created, preserved, and disseminated in the cultural traditions of particular communities."[74] Traditional knowledge is time-tested, as it has enabled local and indigenous communities interact with nature for centuries. Four reasons can be advanced as to why it is particularly vital to protect TK and related genetic resources with the advent of climate change.

1. Eco-friendly Life of Local and Indigenous Communities

Through TK and associated genetic resources, local and indigenous communities are able to live an eco-friendly life with very little impact on the environment, let alone production of GHG. It has been argued, for example, that "if everybody on earth was to enjoy the lifestyle of the average Western European, we would need three planets".[75] Local and indigenous communities have many lessons to offer to the world with respect to environmental conservation and sustainable development. The Convention on Biological Diversity requires member parties to preserve, protect and promote traditional knowledge related to biodiversity conservation.[76] The recently introduced international mechanism for reducing emission through deforestation and forest degradation (REDD) by and large depends on indigenous people who are the custodians of forests. Protection of traditional knowledge, and

73 WIPO (1998–1999).
74 Singhal (2008).
75 WWF (2008). An interesting pictorial illustration is available at http://www.panda.org/about_our_earth/all_publications/living_planet_report/, last accessed 13 August 2009. See also Derclaye (2009:268).
76 See Article 8(j).

social and economic empowerment of local and indigenous communities is vital if forests should remain sustainable.

2. *Poverty Eradication and Community Empowerment*

Along with climate change and loss of biodiversity, global poverty is often cited as one of the world's challenges of the 21st century. Climate change intensifies poverty as it leads to excessive droughts, reduction in the number of livestock and spread of diseases. It is important, therefore to protect traditional knowledge which enables local and indigenous communities to earn a living. "Non protection of TK deprives the owners, who are generally poor, the share in the economic benefits accruing from the use of their knowledge … the condition of the craftsmen deteriorates, leading to poverty and in extreme cases, suicide"[77] As the world is committed to achieving millennium development goals, which, among other things, aim to reduce poverty by half by 2015, it is vital to protect traditional knowledge.

3. *Time-tested Adaptation Strategies*

Local and indigenous communities have a long tradition of interaction with nature. The traditional knowledge related to ecology, food production and preservation, and weather forecasting has enabled them to survive in critical conditions. A study by the Tyndall Centre for Climate Change Research offers examples of practices enabling local and indigenous communities to cope with harsh climatic conditions –[78]

- In the Marshall Islands, people have traditionally secured their freshwater supplies, on which their survival depends, by using coral blocks to build up land around the freshwater lenses and protect them from salt-water intrusion.
- The Kenyah of Borneo, who usually rely on agriculture, sometimes switch to extracting starch from wild Sago palms during El Niño droughts.
- A diversified resource base is a commonly employed strategy to minimise the risk due to harvest failure. People often grow many different crops and varieties (e.g. with different susceptibility to droughts and floods) and supplement these by hunting, fishing and gathering wild food plants.

77 Singhal (2008).
78 Salick & Byg (2007).

These inventive practices ought to be the subject of IPR. Such recognition to TK would come with significant benefits for indigenous communities, including poverty eradication, an important millennium development goal.

II. Protection of TK and Implication for Climate Change Mitigation and Adaptation

Protection of traditional knowledge has become an important agenda in international fora and a topic of interest to lawyers, conservation scientists, anthropologists and development scholars. Such an unprecedented increase in interest is undoubtedly due to the importance TK holds in contemporary social, economic and scientific fields. In spite of this significance, it is widely documented that TK is under threat owing to "lack of respect for TK and its holders, loss of traditional lifestyles, misappropriation of TK, and its usage without any benefit-sharing and the reluctance of the younger members of the community to carry traditional practices forward."[79] Conventional intellectual property rights, particularly patents, have been used as a tool to misappropriate TK, much to the detriment of local and indigenous commu-

79 WIPO (1998–1999).

nities.[80] The *Ayahuasca*[81], *Neem*[82] *and Hoodia*[83] cases as summarised by Gopalan and Sivakumar[84] bring the message across loudly and clearly.

Various ways have been proposed on how to protect traditional knowledge. In this essay we submit that the most important protection strategy is to ensure rights of local and indigenous communities to their ancestral lands. It is impossible to protect traditional knowledge, while destroying the very fabric that puts communities together. Eviction of local and indigenous communities is one of the most destructive and degrading treatments performed by modern governments in developing countries. Armed police and even soldiers are used to evict local communities forcefully, to pave the way for investors hiding in the rubric of climate change mitigation, such as the Clean Development Mechanism.

Positive protection of intellectual creations of local and indigenous communities can contribute to poverty eradication and therefore empowerment to deal with climate change. Access and benefit-sharing, as provided by the Convention on Biological Diversity, is one approach in which researchers are required to obtain prior, informed consent before using traditional knowledge and associated genetic resources of local and indigenous communities. Such economic incentives are crucial with the advent of climate change adaptation. Local and indigenous communities can use such income to build bridges and walls to adapt to effects of sea-level rise and other effects of

80 It is submitted that intellectual property law should do the opposite, which is protection rather than appropriation of TK.

81 The Ayahuasca *Banisteriopsis caapi* is a medicinal plant that has been used by indigenous people in Latin America for centuries. In the early 1980s an American researcher alleged to have discovered its usefulness and was issued with US Patent No 5751 issued in June 1986. As a result of collective efforts by civil societies and individuals, this patent was revoked in 1999, but later upheld.

82 The Neem tress *Azadirachta indica* is native to India and has been used by local and indigenous Indian communities for a long time. It has medicinal, spiritual and economic value. As with the Ayahuasca, the knowledge of the usefulness of the tree was applied, leading to an invention and subsequent grant of a patent by the European Patent Office in 1994. This patent was however revoked in 2000 for lack of novelty.

83 For many years, an indigenous community in Southern Africa known as the San used Hoodia as a hunger suppressant. This traditional use was noted by a Dutch anthropologist in 1937. In 1995 the South African Council for Scientific and Industrial Research obtained a patent for hoodia's appetite suppressing element. A team of researchers patented this knowledge in the United Kingdom and later licensed it to Pfizer, an American pharmaceutical company. Following a threat of legal action by the San, an agreement was reached to share with them future royalties.

84 Gopalan & Sivakumar (2007:58–588).

climate change. Financial resources are also crucial for building water sources such as boreholes and providing other social amenities, which are conspicuously absent among local and indigenous peoples.

E. Conclusion

> Climate change is one of the most complex, multifaceted and serious threats the world faces. The response is fundamentally linked to pressing concerns of sustainable development and global fairness; of economy, poverty reduction and society; and of the world we want to hand down to our children.
>
> *United Nations Secretary-General Ban Ki-Moon*[85]

Climate change is a serious human and environmental threat. It has also been established that intellectual property rights particularly patents can play a vital role in encouraging innovation for technologies needed for climate change mitigation and adaption. Possibilities of patent law to discourage technologies that contribute to emission of GHG have also been explored. Patent law, it has been established, proceeds scientific and policy consensus on anthropogenic or man-induced climate change. This may explain why it is particularly difficult to fit some patent law doctrines into the climate change mitigation and adaptation discourse. An argument often invoked to justify this mismatch is that climate change and other environmental issues can better be dealt with by other branches of the law like environmental law.

While we appreciate the principle of specialisation among legal professionals, we nevertheless hold that environmental issues in general and climate change mitigation and adaptation in particular are too important to be a concern of only a segment of scientists and other professionals. Additionally, we opine that intellectual property rights in general and patents in particular should be seen as part of the solution and not as the source of the problem. It is the authors' view that more discussions among IP professionals, inventors, entrepreneurs and business leaders are essential. These can address ways to remove or minimise obvious mismatches with environmental concerns that invite public outcry against intellectual property rights, particularly patents. Business as usual is no longer the way to go, given the situation we are in.

A discussion on traditional knowledge and associated genetic resources has taken us even further (from our IP tradition) to realise that technology

85 Quoted in WIPO Magazine Issue 2/2009 (April) at 9.

per se is not enough. Protection of TK requires, first and foremost, respect for traditional lands and ancestral territories of local and indigenous communities. This may not be a part of the IP discourse, but it underlies the fact that protection of TK goes beyond the ambits of conventional IP. It also supports the statement above by United Nations Secretary-General Ban Ki-Moon that the response to climate change needs to be done in light of "global fairness" and "economy, poverty reduction and society".[86] In the final analysis safeguarding intellectual property and protection of traditional knowledge can contribute significantly towards achieving climate change mitigation and adaptation. Both offer a unique opportunity of using old techniques to deal with a new challenge.

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86 (ibid.).

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