

Human rights-based approach to intellectual property rights: application in climate change

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In partial fulfilment of the degree of MSc. Med (Bioethics & Health Law)

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April 2016

Acknowledgements

This research report has been a long time in the making. I owe its conclusion to a number of people:

- My Heavenly Father. Thank you for your never-ending blessings, mercy and grace.
- My husband Lester Peter, who introduced me to the legal sciences and has believed in me unceasingly.
- My daughters Siphosethu-Esihle and Liwalam; you girls truly are my most beautiful gifts and my place of solace and repose all rolled into one.
- My mentors, Dr Sibongile Gumbi and Mr McLean Sibanda. I am grateful for your guidance in mapping my career and growth in intellectual property management and technology transfer.

I also dedicate the completion of this research report to my mother and inspiration, Phumzile, and to the memory of my late fathers Siphos Madwe and Sandile Makhanya.

Declaration of work

I, Nomkhosi Sipehelele Peter (Student Number: 391467) am a registered student for MSc.Med (Bioethics and Health Law) in the year 2015.

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- I have followed the required conventions in referencing the thoughts and ideas of others.
- I understand that the University of the Witwatersrand may take disciplinary action against me if there is a belief that this is not my own unaided work or that I have failed to acknowledge the source of the ideas or words in my writing.

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List of Abbreviations and Acronyms

ADP	Ad Hoc Working Group
BRICS	Brazil, Russia, India, China and South Africa
CETs	Clean Energy Technologies
COP	Conference of the Parties
CTCN	Climate Technology Centre and Network
DALY	Disability-Adjusted Life Years
ESCR	Committee on Economic, Social, and Cultural Rights
EST	Environmentally Sound Technology
GHG	Greenhouse Gas
GMO	Genetically Modified Organism
ICCPR	International Covenant on Civil and Political Rights
ICESCR	International Covenant on Economic, Social and Cultural Rights
ICTSD	International Centre for Trade and Sustainable Development
IP	Intellectual Property
IPCC	Intergovernmental Panel on Climate Change
IPIC	Intellectual Property in Respect of Integrated Circuits
IPR	Intellectual Property Right
LDC	Least Developed Country
NGO	Non-government organisation
OECD	Organisation for Economic Cooperation and Development
PCT	Patent Corporation Treaty
TEC	Technology Executive Committee
TRIPS	Trade-Related Aspects of Intellectual Property Rights
TT	Technology Transfer
UDHR	Universal Declaration of Human Rights
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WHO	World Health Organization
WIPO	World Intellectual Property Organization
WMO	World Meteorological Organization
WTO	World Trade Organization

Chapter 1: Literature Review

1.1. Introduction

The emergence of the role of intellectual property (IP) in relation to climate change is a relatively new phenomenon. The World Intellectual Property Organization (WIPO) in its draft paper on IP and climate change (WIPO, n.d.) proffers that the patent system in respect of climate change is a double-edged sword. Its role in facilitating the mitigation of the effects of climate change is dependent on the manner in which the system is applied. To better understand the role of intellectual property rights (IPRs) in climate change, I review the literature to determine what constitutes climate change. I have also sought to analyse and reflect on the ethical aspects and considerations of climate change and introduce the technology transfer ambitions within climate change negotiations and related intellectual property treaties.

1.2. Climate change

Climate change is a global challenge (Hare, Cramer, Schaeffer, Battaglini & Jaeger, 2011). In the past decade, climate change has become a central theme in many political and public debates (Pasgaard & Strange, 2013). The debates have centered on mechanisms to combat the impacts of climate change, to secure mitigation efforts for those most vulnerable to its effects and on ways to reduce the anthropogenic contributions (particularly greenhouse gas emissions) to climate change. Human activities have impacted the environment since the first toolmakers learned to make fire (Peachey, 2008). As the human population has expanded and its activities diversified, so too has the extent of human impact on the environment increased.

Climate change is defined “as a change in the state of the climate that can be identified by changes in the mean and/or variability of its properties and that persists for an extended period (Intergovernmental Panel on Climate Change” (IPCC), 2014). The United Nations Framework Convention on Climate Change (UNFCCC) in its definition of climate change distinguishes between climate change attributable to human activities (anthropogenic climate change) and that resulting from natural causes (UNFCCC, 1992). From this definition, it is clear that climate change has

existed since time immemorial. The noticeable distinction in the UNFCCC definition is an important aspect, as the scientific evidence presented for accelerated climate change attributes the acceleration mainly to human causes. Changes in climate have caused impacts on natural and human systems on all continents and across oceans.

The IPCC (2014) measures the impacts of climate change through changing precipitation, “*shifts in terrestrial freshwater and marine species geographic ranges and seasonal activities, migration patterns, abundances and species interactions*”. It also measures it through negative changes in crop yields and through climate-related extremes that manifest as droughts and heatwaves, as well as floods, cyclones, and wildfires (IPCC, 2014).

The study of climate change is necessarily interdisciplinary, crossing boundaries between science, law, economics and international relations (Gardner, 2012). Through the IPCC, an international body established in 1988 by the United Nations Environment Programme (UNEP) and the World Meteorological Organization, (WMO), those concerned about and with developments in climate change are presented with clear scientific views of the state of knowledge in climate change and its potential environmental and socio-economic impacts. The work of the IPCC enables better understanding of climate change and its impacts. The IPCC was established to provide and prepare, based on available scientific information, assessments on all aspects of climate change and its impacts, with a view to formulating realistic response strategies (IPCC, 2014). Prior to the establishment of the IPCC, it appears that there was no unified body that presented such information, with individual efforts being championed by agencies such as the WMO and the UNEP.

The scientific community accepts with majority consensus that global climate change has surpassed patterns of natural variability and the natural range of human living conditions (Pasgaard & Strange, 2013). A crucial question in the global warming debate concerns “*the extent to which recent climate change is caused by anthropogenic forcing or as a manifestation of natural climate variability*” (Corti, Molteni & Palmer, 1999). Greenhouse gas emissions naturally occur through

activities such as the exchange of heat between the deep ocean and upper ocean layers and the release of carbon dioxide from naturally occurring processes such as condensation. Human actions are increasing greenhouse gas emissions in the atmosphere. Greenhouse gas emissions such as carbon dioxide, methane and nitrous oxide are known to trap heat and keep the planet warmer. Thus an increase in greenhouse gas emissions increases the temperature of the earth. Climate models together with established physical principles confirm that unless there is a reduction in the rate of emission of greenhouse gases and unless those that are already in the atmosphere are stabilised, global warming will continue (Australian Academy of Science, 2010). The interrelatedness of increases in greenhouse gas emissions and rises in global temperature and atmospheric water vapour, the extent of polar ice caps and the levels of greenhouse gas emissions is an established phenomena of climate change effects. Increases in carbon dioxide concentrations have also been found to cause ocean acidification. Greenhouse gas concentrations must be stabilised in a way and within a span of time that allows for the natural adaptation of ecosystems, such that food security is not threatened and that economic development is able to proceed in a sustainable manner (Hare *et al.*, 2011).

Climate change effects are evidenced by a number of observations on ecosystem properties. The effects of climate change are measured in several ways including substantial loss or damage to biodiversity, reduced food production and provision of livelihood and significant changes in the spatial extent and geographical locations of ecosystems. Various studies have been undertaken in different global locations to measure the impacts of climate change. The IPCC, drawing on the published results of leading modelling groups around the world, “*forecasts an increase in world average temperature by 2100 within the range 1.4–5.8°C*” (McMicheal, Woodruff, & Hales, 2006). In Southern Africa, it has been determined that a 2°C warming could reduce the endemic flora species richness of the region by as much as 40% (Midgley & Thuiller, 2007). Similar studies in Europe and China predict a 25% probability of certain species extinction from Mediterranean Europe – a 35% transformation in Northern Europe owing to the introduction of new species in that area and the loss of grasslands and high elevation meadows in parts of China. The above-noted changes

in these regions are attributable to mean temperature increases of 1.5-3°C in the respective regions (Ni, 2010; Hughes, 2010).

The growing realisation of the threat posed by climate change has been termed one of the greatest challenges facing humanity today. In response to the growing challenge, the UNFCCC was adopted in 1992. The UNFCCC is an international agreement whereby parties to the Convention are associated by mutual agreement towards a reduction in global average temperatures and the resultant impacts of climate change. South Africa is party to the UNFCCC and participates actively in the Conference of the Parties (COP). The 17th COP was hosted by South Africa in Durban in December 2011 (UNFCCC, 2011).

Article 2 of the Convention promotes mutual responsibility and cooperation towards the reduction of dangerous interference with the climate system. It states, *“the ultimate objective of the Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner ”* (UNFCCC, 2011).

It is arguable as to just how successful the UNFCCC has been in promoting this objective. It is my view that the watered-down commitments that have been witnessed in various rounds of negotiations between the parties are indicative of a lacklustre commitment to the realisation of these lofty ambitions.

The Kyoto Protocol was signed in 1997 under the UNFCCC, and it is a binding arrangement that sets targets for 37 industrialised countries and the European Community to reduce greenhouse gas (GHG) emissions. Levels of GHG emissions measured in 1990 are the baseline standard, with the intention being to reduce these by 5% over the period 2008-2012. The Kyoto Protocol came to an end in 2012. Its

term was extended by a meeting of the COP to the UNFCCC in December 2011. The Ad Hoc Working Group (ADP) on the Durban Platform for Enhanced Action was established as a subsidiary body in December 2011 at COP 17. The mandate of the ADP *“is to develop a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties. This work must be completed by no later than 2015 in order for the protocol to be adopted at COP 21 in December 2015 and for it to come into effect and be implemented from 2020”* (Department of Science and Technology, 2015). The new protocol would replace the Kyoto Protocol at the completion of the second commitment period in 2020. The terms and binding nature of a post-Kyoto agreement, if agreed to, will define just how serious and committed parties to the UNFCCC are towards addressing the challenges of climate change.

The UNFCCC recognises the need for development and transfer of environmentally sound technologies in the fight against climate change. Article 4(c) of the Convention urges parties through consideration of specific national and regional development priorities *“to promote and cooperate in the development, application and diffusion, including transfer of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases”* (UNFCCC, 1992). Technology transfer is largely dependent on the availability, recognition and enforcement of intellectual property rights. The IPCC defines technology transfer for climate change as *“as a broad set of processes covering the flows of know-how, experience and equipment for mitigating and adapting to climate change amongst different stakeholders such as governments, private sector entities, financial institutions, non-governmental organisations (NGOs) and research/education institutions”* (IPCC, 2010: 3). I agree with this definition and would go so far as to contend that considering the pivotal role of intellectual property rights in technology transfer, in climate change, technology transfer must involve a North-South dimension and cannot be applied uniformly, i.e. there cannot be a one-size-fits-all approach.

In attempting to determine the relevance of the intellectual property rights regime in the fight against climate change, it is necessary to review the international regime

under which such rights are realised and assess the work done to date by various bodies to elucidate the possible challenges or opportunities that are posed by intellectual property rights in dealing with the climate change challenge.

1.3. Intellectual property rights

Article 27 of the Universal Declaration of Human Rights (UDHR) states:

- *“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.*
- *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”* (UDHR, 1948).

The rights espoused in Article 27 of the UDHR are exercised and enjoyed as IPRs. As a legal principle, intellectual property rights are a legal monopoly granted over the creation of a mind that may be either artistic or commercial, and such rights granted in the corresponding fields of law intellectual property rights are territorial. Intellectual property rights *“were conceived as private rights to reward innovation and promote dissemination of knowledge in the context of broader societal goals”* (International Centre for Trade and Sustainable Development (ICTSD), 2009). The most common forms of intellectual property rights include trademarks, patents, copyright, designs and trade secrets. In South Africa, trademarks, patents, copyrights and designs are afforded statutory protection, with trade secrets being protected through common law principles. Patent protection is most regularly sought to grant a monopoly on the use and application for scientific and technological inventions.

Whilst previously regulated by national laws, intellectual property rights are now managed in accordance with various international prescripts. The most notable of these is the Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement, under the World Trade Organization (WTO). The TRIPS Agreement builds on provisions set out in other conventions such as the Paris Convention for the Protection of Industrial Property, the Berne Convention for the Protection of Literary and Artistic Works, and the Treaty on Intellectual Property in Respect of Integrated Circuits (IPIC Treaty) (Reichman, 1995). The TRIPS Agreement provides minimum standards that national governments need to grant to specific domains of intellectual property, i.e.

- a) the principle of national treatment – non-discrimination against foreign rights holders;
- b) the most favoured nation principle which serves to prevent one member state providing better standards of protection to a second state (better than provided for by international law) and then denying the same privilege to another state; and
- c) the need to afford nationals of other member states the minimum international protection standards as set out in the TRIPS Agreement (WTO, 1994).

Under TRIPS, the WTO enforces a set of internationally recognised standards for IPRs into national laws and provides a dispute settlement mechanism, the Dispute Settlement Understanding (Yueh, 2007). The Dispute Settlement aspects of TRIPS include the establishment of a Dispute Settlement Body “*to administer the rules, procedures and consultation, and dispute settlement provisions of concluded agreements*” (WTO, 1994).

Arguably, TRIPS has most benefited developed nations. It has raised the international profile and standard of intellectual property rights and patents, in particular, and closely aligned these with economic development. Notable provisions within TRIPS that may be used to substantiate this include the requirement that member states not exclude entire technology fields from patentability, that there are minimum protection terms of 20 years and the provision of a bundle of rights to be enjoyed by patent holders, inclusive of the right to supply imports of the patented product (Reichman, 1995).

Article 27 of the TRIPS Agreement allows for the granting of patents for “*any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application*”. Under TRIPS, the length and breadth of the exclusivity rights granted under patent law have been standardised. The general patent term introduced by TRIPS is that a patent is valid for 20 years from the date of filing. TRIPS also sets out exceptions to

IPR protection under limited circumstances. In elaborating this general rule, Article 27(2) specifically mentions inventions that are contrary to nature i.e. *“human, animal or plant life or health or seriously prejudicial to the environment”* (WTO, 1994). A national example of this application of patent exception under the TRIPS Agreement is found in the South African Patents Act (South Africa, 1978) whereby

“A patent shall not be granted:

- a) for an invention the publication or exploitation of which would be generally expected to encourage offensive or immoral behaviour; or*
- b) for any variety of animal or plant or any essentially biological process for the production of animals or plants, not being a micro-biological process or the product of such a process”.*

This provision is but one of the amendments made to the Patents Act as a way of South Africa conforming to obligations brought into being by it being a member of the WTO.

Intellectual property rights have significant effects on economic development. The justification for IPRs generally relates to the need for protecting the incentive to innovate weighed against the social cost of allowing monopoly profits to accrue and the loss to society not having free access to the protected goods (Yueh, 2007). The possibility of awarding patent rights for scientific inventions was intended to stimulate innovation and to provide an efficient and enabling system for knowledge dissemination (Brown, 2010). The significance of IPRs in economic activity differs across countries and depends (1) *“on the amount of resources countries devote to creating intellectual assets as well as (2) the amount of protected knowledge and information used in production and consumption”* (Primo Braga, Fink & Sepulveda, 1998). I am of the view that sound intellectual property policies and frameworks are a necessary constituent of any thriving economy.

The interplay between intellectual property and human rights requires an implicit balance between the rights of inventors/creators and the interests of the wider society (Chapman, 1998). This balance is to an extent expressed in Article 15 of the

International Covenant on Economic, Social and Cultural Rights (ICESCR) which states, “ ... recognise the right of everyone to both enjoy the benefits of scientific progress and its applications ... to benefit from the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author ... ” (ICESCR, 1966). In applying the existing IPR regime, this balance between private rights and broader societal benefits cannot be exercised in a manner that flouts basic human rights. Such an approach is both feasible and realistic when addressing issues that impact on broader society such as public health and access to medicines. I posit that the test to determine which of the two – between private rights and broader human interest – is superior is the extent to which the enjoyment of those rights most extensively complies with human rights. A human rights-based approach towards intellectual property rights administration will be dealt with in Chapter 5.

The primary difference between a human rights approach and conventional legal principles to intellectual property law is that the human rights approach advocates that the type and level of protection afforded under any intellectual property regime must promote scientific progress and its application in a manner that broadly benefits members of society on an individual and collective level (Chapman, 1998). This is in contrast to the individualism expressed in the law that induces individual rights for reward and recognition of intellectual property creation and invention.

Article 66 of the TRIPS Agreement presents flexibilities at the disposal of developing and least developed countries (LDCs) in transitioning towards their full compliance with the minimum standards imposed by TRIPS. These flexibilities have been used previously to realise the aspirations of access to medicines that are still under a patent protection term and need to be explored in greater detail to determine their applicability and relevance to intellectual property rights in the climate change debate. In attempting to resolve this possible imbalance between human rights and intellectual property law, the TRIPS Agreement has been used in the promotion of access to medicines. I opine that it can equally be applied effectively in support of the paradigm that intellectual property and human rights are not mutually exclusive.

According to Littleton (2009), "*modification of the global intellectual property rights regime is vital to climate change mitigation and adaptation efforts in developing countries*". Under Article 4 of the UNFCCC, the parties have at various meetings reached consensus on a number of pertinent issues concerning technology development and transfer. Decision 1/CP.13 as contained within the Bali Action Plan in paragraph (d) reads as follows:

"Enhanced action on technology development and transfer to support action on mitigation and adaptation, should include, inter alia, consideration of:

- i. Effective mechanisms and enhanced means for the removal of obstacles to, and provision of financial and other incentives for, scaling up of the development and transfer of technology to developing country Parties in order to promote access to affordable environmentally sound technologies;*
- ii. Ways to accelerate deployment, diffusion and transfer of affordable environmentally sound technologies... "* (Bali Action Plan, 2012).

In line with the Bali Action Plan, the Cancun Agreements (Cancun Agreements, 2010), which reflect the decision of the Conference of the Parties meeting in 2010, determined the need to assess all applicable factors involved with achieving operationalisation of the technology mechanism under the Convention. The technology mechanism confirmed in Cancun provides for the establishment of the Technology Executive Committee (TEC) and the Climate Technology Centre and Network (CTCN). The existence of these structures is meant to foster increased traction on technology development and transfer in climate change.

It is within negotiations on the implementation of the technology development, transfer and diffusion ambitions of the Convention that the notion of intellectual property rights has presented an area of contention between the parties involved and has contributed towards a delay in the realisation of the technology ambitions within the Convention. The need exists for industrialised economies that have developed environmentally sound technologies (ESTs) to make these available to enhance

developing countries' economic performance through the use of technologies with low environmental impact and evade the pollution problems synonymous with industrialisation (Morsink, Hofman & Lovett, 2011). This would require the adoption of an explicit legally and ethically sound policy position within the UNFCCC on intellectual property rights, climate change and the development, transfer and diffusion of environmentally sound technologies. By implication, this would include the need to analyse the applicability and role of intellectual property rights in this context. Krattiger (2007) makes the point that "*whether viewed as a legal concept, a social construct, a business asset, or an instrument of humanitarian objectives, intellectual property is an important driver of innovation*".

1.4. Study aim

Having introduced the key aspects of the study as part of this literature review, the aim of the study is to consider and assess the role of intellectual property rights instruments and their inter-relatedness to human rights. The aim is also to determine how they have contributed towards the equitable realisation of the equal but differentiated responsibilities towards climate change adaptation and mitigation. This is dealt with by commencing with a reflection on the ethical aspects of climate change in Chapter 2.

Chapter 3 reviews three studies that analyse the role of intellectual property rights in promoting the transfer of environmentally sound technologies. Chapter 4 deals in detail with the TRIPS Agreement as the key international intellectual property treaty and reflects on the application of the TRIPS Agreement regarding access to medicines. Furthermore, flexibilities of TRIPS and the opportunities the flexibilities present to developing and least developed countries are discussed.

In the concluding chapter, the interplay between ethics, intellectual property rights and climate change are interwoven, where an argument is made for a human rights-based approach to the application of the intellectual property rights regime.

Chapter 2: The Ethics of Climate Change

2.1. Introduction

Trends in energy conservation, pollution control, population growth, urban planning and economic development have brought the concept of sustainability to international attention (Scherer 2003:355). Science has alerted many to the impact of humankind on the planet, one another, and all life (Jamieson; 2003: 378 is raises certain ethical questions on humans' relationship with nature and the environment.

The preceding chapter reviewed literature relevant to this study. This second chapter briefly reviews ethics and the environment, and presents some ethical issues to be considered in responding to climate change. Reflection is also made on the impact of climate change on public health, with the aim of introducing public health as a human rights issue to be dealt with in ensuing chapters.

2.2. An environmental ethic

Ongoing efforts in adaption and mitigation of climate change beg the question: why is the environment (and climate change) an ethical issue? *"Climate change is an ethical issue because it involves the distribution of a scarce resource – the capacity of the atmosphere to absorb the earth's waste gases without producing consequences that no one wants"* (Singer, 2006).

Whilst there are several schools of thought that have informed the momentum on environmental ethics, Cagnon Thompson and Barton (1994) suggest that there are two motives that underlie support for environmental ethics; these are ecocentrism and anthropocentrism. *"Anthropocentrism considers humans to be the most important life form and other forms of life to be important only to the extent that they affect humans or can be useful to humans"* (Kortenkamp & Moore, 2001). Other ethical contributions on the environment include holistic environmental ethics, the foundational work which forms Aldo Leopold's guiding principle, *" a thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise "* (Palmer, 2012: 320). For individualist

consequentialism, the unit of ethical concern is always the individual organism rather than the ecosystem or the species (Palmer, 2012). Individual deontologists premise their ethical stance on the environment on inherent worth, whether living or dead. Whilst all these and other ethic principles are relevant to environmental ethics, in the context of climate change, I limit my review in this study to anthropocentrism, as it is my opinion that this principle by far informs the majority of responses and proposals to dealing with climate change. An anthropocentric relationship with the environment is reduced to survivalist norms, i.e. how do people interact with and survive off the environment.

An anthropocentric environmental ethic requires an evaluation of humanities' relationship with the environment to date and the ethical principles that should inform policies developed to mitigate and adapt to the impacts of climate change. Peachey (2008) states that the human environment interaction has been marked by five distinct phases:

- Phase 1: Humans and nature interacted without significant conflict. This phase was based ideologically on basic origins and beliefs in culture and religion.
- Phase 2: An apt description of this phase would be "battling nature for survival". It was marked by technological development and advances in agriculture.
- Phase 3: Following on the technology revolutions, this phase can be referred to as "taming the environment" and aligns with developments of structures such as dams and the industrial revolution.
- Phase 4: Scientific advancement including the development of genetics.
- Phase 5: The current realisation of humans' ability to destroy nature through wars, industrialisation, population overgrowth and associated consumerism.

Norton (1991) classifies environmental problems according to their historic significance as first, second and third generation. No 'generation' of problem stands alone, though, because they should all be considered as intertwined. First-generation environmental problems are about the use and abuse of natural

resources, such as consumerism, resulting in resource wastefulness. Problems such as these are considered focused or localised. Second-generation environmental problems are those which concern larger systems. An example of this is how the plastic industry impacts on the atmosphere. Third-generation environmental problems represent *“changes in intermediate sub-systems, such as the atmosphere over cities and tropical forests, on yet larger systems, such as the global climate”* (Norton, 1991: 214). Concerning third-generation environmental problems, Norton’s position is that people should all adopt a rationally defensible worldview that must be supported by science, aesthetic and moral ideals.

Gardiner (2006) recognises that climate change is complex and interdisciplinary. From an ethical perspective, Gardiner presents three dimensions under which climate change effects need to be addressed:

- *“dispersion of cause and effects;*
- *fragmentation of agency; and*
- *institutional inadequacy”.*

Dispersion of cause and effects is demonstrated by the scientifically established notion that the impact of particular greenhouse gas emissions is not realised solely at its source. Rather, according to this dimension, it is dispersed across the globe once such emissions have been absorbed into the upper atmosphere (Gardiner, 2006).

Climate change is not caused by a single agent. This fragmentation of agency involves multiple individuals and institutions that may not necessarily be unified in structure of agency and therefore would struggle to respond as a unified collective to the effects of climate change (Gardiner, 2006). This further encumbers the ability to coordinate an effective response to global climate change.

Addressing the institutional inadequacy dimension would require an effective system of global governance. In the current international system of national states and sovereign rights, global regulation of greenhouse gas emissions and reliable

enforcement mechanisms are difficult to implement. The observation of Gardiner (2006) of the complexity of the climate change problem is reinforced by Tubi, Fischhendler and Feitelson (2012). Tubi *et al.* (2012) attest that climate change is a global problem, the solution to which cannot be addressed through the means of any single state. According to these authors, the effects of climate change are long term and not easily perceptible in the immediate term. Thirdly, the authors submit that because of the behavioural change aspects necessary to tackle the problem, many governments lack the ability and incentive to develop actions against climate change.

2.3. The ethics of climate change

The Buenos Aires Draft Declaration on the Ethical Dimensions of Climate Change (2004) presents a number of reasons why ethics is relevant and should guide the development of policies to address the challenges of climate change and the environment. The draft declaration states, "*climate change policies raise profound ethical issues concerning e.g. which humans, societies, communities, plants, animals and ecosystems will survive and which persons and countries will bear the burdens of climate change*". The draft declaration recognises explicitly the impacts and implications of climate change to human health.

The ethical discourse on climate change is premised on the following:

- The environment being a common resource that no individual person has stronger claim to than any other.
- The consequences of climate change are far-reaching and also unevenly distributed within and between generations.
- Rich countries have the greatest greenhouse gas emissions per capita and, as such, are the main causes of human-induced global warming (Kamminga, 2008).

There can be little question on the distribution of the causes and effects of climate change. The UNFCCC in its preamble recognises this disparity between developed and developing countries through "*Noting that the largest share of historical and*

current global emissions of greenhouse gases has originated in developed countries, that per capita emissions in developing countries are still relatively low and that the share of global emissions originating in developing countries will grow to meet their social and development needs,...”(UNFCCC, 1992). Common but differentiated responsibilities and respective capabilities are a recurring theme within the UNFCCC.

The climate change dilemma should ideally be dealt with in a manner that appreciates the issues of global justice and fairness. The introduction of an environmental dimension on justice has been termed environmental justice. Environmental justice refers to the conceptual connections and causal relationships between environmental issues and social justice (Figueroa & Mills, 2001). Mills (quoted in Klinsky and Dowlatabadi, 2009) indicated, “*justice is the chief part and incomparably the most sacred and binding part of all morality*”. Nowhere is this more clearly evident than in climate change policy and in addressing the burdens and effects of climate change. There are two dimensions to environmental justice, i.e. distributive justice and participatory justice. Müller (2001) highlights that one of the important distributive justice questions in climate change is the issue of burden sharing and distributing the different types (mitigation/adaptation) of prospective costs and benefits due to climate change. I believe that the UNFCCC in its ideal mode of operation would be an example of participatory justice whereby the interests of even the most vulnerable and disempowered are equally represented and taken into account in adopting actions on climate change. According to Bass cited by Ikeme (2003) “*it would be the fair treatment and meaningful involvement of all people regardless of race, colour, national origin, or income with respect to the development, implementation, and enforcement of environmental laws*”.

A prevailing controversy in the economic analysis of climate change policy “*is how to weigh the cost of implementing changes now against the benefits that future generations will realise or the harm they will avoid*” (Rotman, 2013). Ethically relevant criteria for determining equitable distribution of harms and effects would include per capita rights to use the atmosphere as a sink for disposal of GHG

emissions, historical responsibility for causing the existing problem, ability to pay for low-emitting technologies and allocations that give priority for need over luxury emissions (Brown, 2012). This introduces a new dimension to environmental ethics – that of environmental equity. What diplomats and lawyers call equity incorporates important aspects of what ordinary people call fairness (Shue, 2012).

The White Paper on the Ethical Dimensions of Climate Change (Rock Ethics Institute, n.d.) identifies a number of specific ethical issues and associated questions concerning climate change. From an equity perspective, these issues include:

- *“Responsibility for Damages: Who is ethically responsible for the consequences of climate change, i.e. who is liable for the burdens of:*
 - *preparing for and then responding to climate change (i.e. adaptation) or*
 - *paying for unavoided damages?*
- *Allocating GHG Emissions Reductions: What ethical principles should be followed in allocating responsibility among people, organisations, and governments at all levels to prevent ethically intolerable impacts from climate change?*
- *Cost to National Economies: Is the commonly used justification of national cost for delaying or minimising climate change action ethically justified”?*

Shue (2012) proposes three principal justifications that would bode well for an equitable solution to climate change. The first justification is of *“unequal burdens intended to reduce or eliminate the existing inequality by removing an unfair advantage of those that are at the top”*. Secondly, there is the justification of *“unequal burdens intended to prevent the existing inequality from becoming worse through any infliction of an unfair additional disadvantage upon those at the bottom”*. The final justification *“is of a guaranteed minimum intended to prevent the existing inequality from becoming worse through any infliction of an unfair additional disadvantage upon those at the bottom”*. The manner in which I interpret this is that the playing fields need to be leveled in as far as industrialisation is concerned. The rich and industrialised North cannot expect developing nations and least developed nations to put their industrialisation efforts on hold only because there is now an

appreciation and scientific evidence of the contribution of such activity towards greenhouse gas emissions and climate change. Secondly, the North should rightfully assume greater responsibility for the causes of climate change and therefore spearhead and fund efforts aimed at mitigating its effects. Finally, delaying access to technology transfer opportunities of environmentally sound technologies and presenting barriers such as intellectual property rights further prejudices poorer nations in the South who are already at a disadvantage because of other factors necessary to fully deploy environmentally sound technologies and green their environments.

2.4. The environment and human rights

“Human rights and fundamental freedoms are the birthright of all human beings; their protection and promotion is the responsibility of governments” (Vienna Declaration, 1993). Environmentalists have sought recognition for the right to a safe environment in national and international fora for over 25 years (Nickel, 1993). The need for such recognition is grounded on the realisation that human life and the environment are intertwined. To survive, humans must have air to breathe, water to drink, food to eat and a place to live, and should such elements become polluted, contaminated or be eliminated or destroyed, life would cease to exist (Thorne, 1991). In essence, the survival of human life is inseparable from the state of the environment. Damage to the environment diminishes quality of life – immediately, for those directly affected and in the long term, for everyone (Popović, 1996).

A growing number of global and regional human rights instruments include the right to a safe, healthy environment (Shelton, 1991). The ICESCR in Article 12(2)(b) recognises the right of everyone to enjoy the highest attainable standard of physical and mental health and instructs State Parties to the present Covenant that to achieve the full realisation of this right, improvement of all aspects of environmental and industrial hygiene shall be necessary (ICESCR, 1966).

However, environmental rights do not measure squarely to the merits of any category of human rights. Typically, human rights are classified as follows:

- First generation – associated with civil and political rights and activity. These rights are espoused in the Universal Declaration of Human Rights.
- Second generation – rights that guarantee economic and social rights of individuals (contained in the United Nations twin covenants of the ICESCR; the International Covenant on Civil and Political Rights (ICCPR)).
- Third generation (so-called ‘solidarity’ rights) – rights that can only be fully achieved in a communal sense (Dhai & McQuoid Maison, 2011).

Examples of each class of human rights would be the right to freedom of conscience and expression as a first-generation right, the right to health as a second-generation human right and the right to a healthy environment as a third-generation human right (Boyle 2010). As a solidarity right, the right to a clean environment grants communities rather than individuals the right to determine how their environment and natural resources are protected and managed (Boyle, 2010).

The right to a healthy environment is closely linked with health and well-being. It is therefore not surprising that frequently the impacts of climate change are measured in ways that relate to human health and wellness.

2.5. Climate change and human health

Climate change affects everyone, every culture and every sector of society in interconnected ways (Morito, 2010). It has long been recognised that the state of the environment has implications on human health. Climate change impacts on the environment and contributes towards an accelerated change in its state and composition. Vulnerability is commonly used to identify those population groups that are most likely to experience the negative effects of natural hazards as well as the adverse consequences of social, economic or political forces (Tubi *et al.*, 2012).

“Literature on health vulnerability and adaptation assessments includes descriptions of approaches to assessing climate change and health vulnerabilities, of both quantitative and qualitative varieties. However, these methods do not always reflect the practical necessities of climate change and health work in small, developing

countries where resources are scant and the relevant data is scarce" (McIver, Woodward, Davies, Tibwe & Iddings, 2014). Immediate effects on mortality rates are brought about by instances of extremes in temperature and rainfall, heat waves, floods and drought (Haines, Kovats, Campbell-Lendrum & Corvalan, 2006). Heat waves; fires; undernutrition; *"lost labour productivity; the spread of food, water and vector-borne diseases; and higher incidences of climate-related non-communicable disease pose mounting challenges"* (Thomas, Sabel, Morton, Hiscock & Depledge, 2014). Extreme weather events characterised by very high temperatures, torrential rains and flooding, droughts and storms are on the increase (Tubi *et al.*, 2012). Anthropogenic climate change is reported to have claimed over 150,000 lives since 1970 (Thomas *et al.*, 2014). It is important for an epidemiologist to understand these events and their related impact on health, as indications from climate change modelling data are that such extremities are on the increase. Epstein (2005) notes that increased weather variability contributed to the emergence of both the hantavirus pulmonary syndrome and West Nile fever in the United States.

There are multiple modes by which climate change affects human health. It is beyond the scope of this research report to examine each in detail. Figure 1 depicts the multiple potential health effects of climate change and aims to depict the potential magnitude of the challenge posed by climate change to the continued survival of humans.

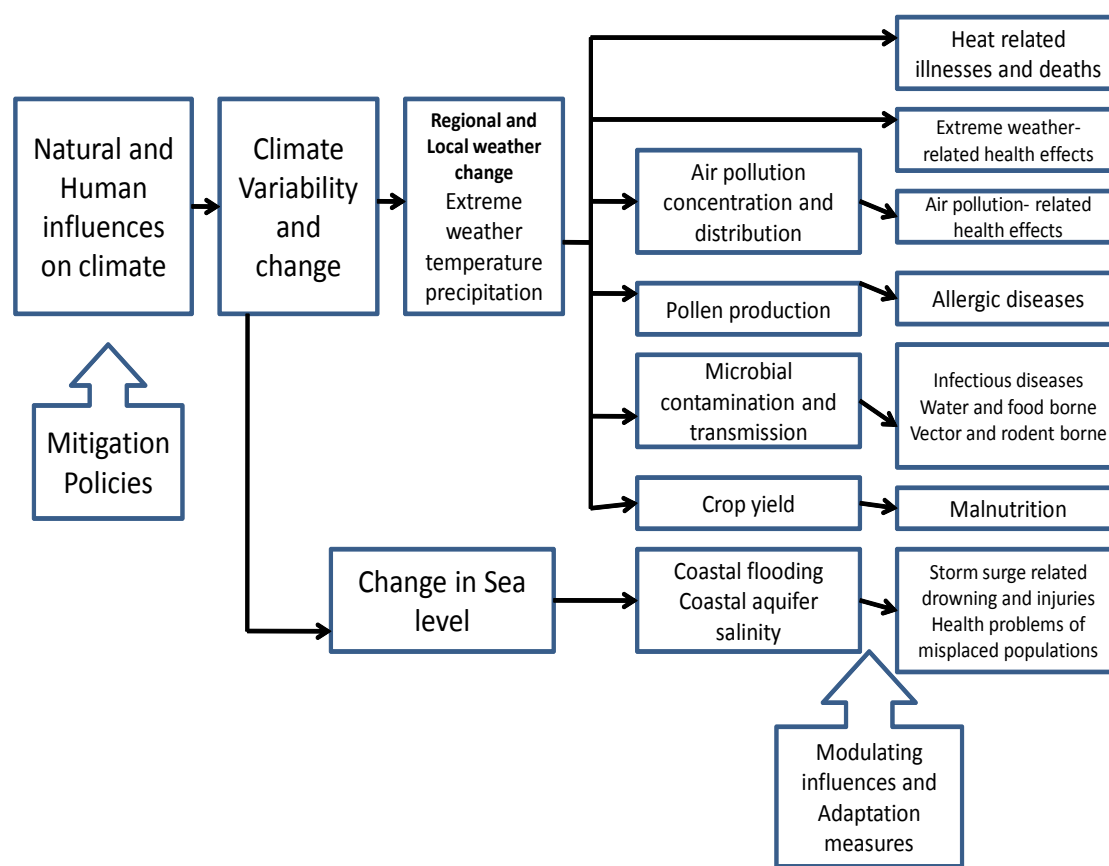


Figure 1: Potential health effects of climate variability and change

Adapted: Haines *et al.* (2006)

It is reported that the World Health Organization (WHO) has embarked on an exercise to quantify the global burden of disease that could be due to climate change. The burden of disease is measured in terms of disability-adjusted life years (DALY) and seeks to extend the focus from the immediate human health effects of climate change with a focus just on mortality to taking into account those impacts that do not necessarily lead to death but cause disability (Haines, Kovats, Campbell-Lendrum and Corvalan, 2006).

Noticeably, the effect of climate change will differ geographically. Nevertheless, the most severe consequences of climate change will accrue to the poorest people in the poorest countries (St. Louis & Hess, 2008). It will have its greatest effect on those who have the least access to the world's resources and who have contributed

least to its cause (Castello et. al, 2009). Climate change poses the biggest threat towards the health of vulnerable groups such as the poor, elderly, the infirm and children.

2.6. Conclusion

Climate change is an ethical issue because it involves the distribution of a scarce resource (Singer, 2006). The ethical arguments for the environment can be deduced from a number of well-established ethical principles. The greatest impacts of climate change will highly be manifest in vulnerable communities in the South. Environmental justice (as an ethical principle) introduces elements of equity into how solutions to climate change are developed and implemented. Equity and fairness are important bedrocks on which any policy or response to climate change should be based. The involvement of all spheres of society irrespective of their economic standing, race, nationality or any other discriminatory factor must be dealt with in a manner that recognises that climate change affects all. The rationale for an ethical position on climate change informed by its impact on human health is well established, but an environmental ethic cannot be informed solely by the need to address the health aspects of climate change. The ideal response to climate change is ethically complex and cannot be aligned with just one ethical principle.

Chapter 3: Intellectual Property Rights and Climate Change

3.1. Introduction

It has been stated earlier in this report that intellectual property rights are potentially a double-edged sword in the climate change arena. This is because intellectual property rights have “ *significant effects on economic development and the environment, largely through their impact on the availability and deployment of technologies in the developing world*” (Littleton, 2009).

The role of technology transfer and its relationship with intellectual property rights within the UNFCCC was introduced in Chapter 1. Since the adoption of the UNFCCC, various meetings of the parties have attempted to progress to the use of technology in mitigating and adapting to the effects of climate change. A decision of the COP 16 of 2010 noted the establishment of the CTCN and the TEC as instruments for facilitating the realisation of the technology transfer ambitions within the UNFCCC (UNFCCC, 2010).

The previous chapter considered the ethics of climate change. This chapter will focus on an analysis of three reports that have sought to determine solutions and propose recommendations as to how intellectual property rights progress or disrupt the transfer of environmentally sound technologies within the technology track of the UNFCCC. The three reports are analysed for the challenges and/or opportunities presented by intellectual property rights in climate change. The chapter concludes with a summary of the findings of the three studies.

3.2. Global Challenges Report: Intellectual Property and the Transfer of Environmentally Sound Technologies

The first report to be considered is the Global Challenges Report. The Global Challenges Report was commissioned by the World Intellectual Property Organization in 2011. The report focuses on the role of intellectual property rights in enabling the technological transfer of environmentally sound technologies to entities in developing countries.

The report premises its review of the impact of intellectual property rights in climate change on how the intellectual property regime facilitates technology transfer opportunities. It recognises the importance of technology transfer within the UNFCCC and refers to the emphasis placed on technology transfer in the Bali Action Plan. A notable observation made in the report is that developing countries should actively promote environmentally sound technology assimilation and utilisation. One of the studies reviewed in the Global Challenges Report in an effort to provide detailed reflection on IPRs in EST transfer is highlighted in Lee, Iliev and Preston (2009) by Chatham House. The Chatham House Review concludes that IPRs affect the speed at which technology is diffused. It would be agreeable that delays are inevitable in technology diffusion in the instance of ESTs that are still under patent protection, as any access would be preceded by contractual negotiations of licence terms. A similar finding is made in Copenhagen Economics and the IPR Company (2009).

Importantly, in my assessment, the Global Challenges Report identifies a number of additional barriers that present greater challenges to technology transfer than just intellectual property rights. These are scientific capability, infrastructure, human capital, market conditions and investment climate. In agreeing with the additional barriers identified, I assert that intellectual property rights are (a) a means to an end; (b) that the practice and enforcement of intellectual property rights are dependent on the availability of a conducive legislative, regulatory and economic environment; and (c) that the practice of a patented invention requires skills that at times are not readily available in developing countries. The last of these conditions is in fact found

in most patent legislation. By way of example, the South African Patents Act (Patent Act, 1978) in section 25(10) sets a condition for eligibility for patent protection, as *“an invention shall be deemed to involve an inventive step if it is not obvious to a person skilled in the art”*. It is my opinion that this provision recognises the need for skill in whatever the field of invention is in order for the invention contained in the patent to be practiced effectively.

As its focus is on the transfer of ESTs to developing countries, the Global Challenges Report provides a review of the conditions enabling technology transfer in China, India and Brazil. Useful parallels may be drawn with South Africa from these three countries in line with the similarities that informed the establishment of the BRICS economic association between Brazil, Russia, India, China and South Africa (BRICS) (Morazan, Knoke, Knoblauch & Schafer, 2012). From the report of Chatham House, it was found that China is the only non-Organisation for Economic Cooperation and Development (OECD) country that featured amongst the top six patenting nations for ESTs in categories such as wind, concentrated solar power and cleaner coal and carbon capture. As can be expected, the other countries in the top six are well-established, industrialised economies; they are members of the WTO and have solid intellectual property rights management and enforcement regimes.

Finally, the Global Challenges Report concludes that the importance of IPRs varies from one context to another. The circumstances and conditions of application may differ vastly based on the type of sector. Governments that aim to enhance the ongoing, sustainable transfer of ESTs should develop frameworks that integrate intellectual property policies with other types of pro-investment policies (Perez, 2011). This will go a long way in dealing in a holistic manner with all factors necessary for the effective and efficient transfer of technologies from IPRs holders to entities and agencies in developing countries.

3.3. Technologies for Climate Change and Intellectual Property: Issues for Small/Developing Countries

The Technologies for Climate Change and Intellectual Property Review authored by Gueye K (2009) , is an effort by the International Centre for Trade and Sustainable Development to determine the relevant factors that promote technology transfer of climate-related technologies within the UNFCCC. The review recognises that the development and transfer of technology is emerging as a fundamental tenet of a post-Kyoto (the Kyoto Protocol was meant to end in 2012, but it was subsequently extended to 2015) regime on climate change.

The ICTSD study delineates the range of technologies needed for mitigation and adaptation. These include “*technologies needed for observation and monitoring of climate, technologies for mitigation such as energy-efficient and renewable energy technologies, energy-efficient transportation technologies, and energy and material-saving building and construction technologies*”. Also referenced, are technologies for “*low greenhouse gas emission technologies for agriculture and animal husbandry, and technologies for adaptation, which would include water saving, water capture and reuse technologies, agricultural biotechnology, disease and pest control technology, flood, drought and sea level rise, agricultural disasters and desertification control technologies*” (ICTSD, 2009). Clearly, technology presents viable and tangible solutions in responding to various elements of climate change. Still, even from the examples of required technological solutions cited in the ICTSD study, it is clear that these technologies cut across a range of sectors and have application in multiple fields that may have additional regulatory factors. For example, agricultural biotechnology and disease and pest control technologies may stray into genetically modified organisms that are further regulated by additional legislation such as the Genetically Modified Organisms (GMO) Act in South Africa (GMO Act, 1997).

Climate change is unique in the sense that (a) it transgresses political boundaries; (b) it is not time-bound; (c) it can be intergenerational; (d) its impacts are detrimental to basic survival resources such as energy, water and food; and (e) the impacts of climate change may have consequences in public health. This plethora of conditions

concomitant with climate change can therefore not be dealt with using an inflexible approach to intellectual property rights, particularly where least developing countries are concerned.

The ICTSD adopts a definition of technology transfer used in the Draft International Code of Conduct on the Transfer of Technology (1985). According to this definition, transfer of technology is the “*transfer of systemic knowledge for the manufacture of a product, for the application of a process or for rendering a service*”. Intellectual property rights are again noted as a necessary constituent of technology transfer, but ICTSD surmises that the existence of IPRs alone does not guarantee or suffice for the effective transfer of technology (ICTSD, 2009). Additional requirements for effective technology transfer would include appropriate infrastructure, governance and competition systems. I would add legal regime, human capital, economic climate and institutional arrangement such as higher education institutions and development financing agencies to the additional requirements for effective technology transfer.

The Technologies for Climate Change and Intellectual Property Review identifies challenges faced by LDCs in attempting technology transfer within existing intellectual property rights regime. First, the absorption of technologies within least developing states occurs primarily through imitation, which may involve reverse engineering. Secondly, formal mechanisms for technology transfer such as trade in goods, foreign direct investment and licensing have a limited effect in LDCs. Finally, circumstances such as weak regulatory mechanisms and limited market size limit the effectiveness of formal technology transfer mechanisms in small economies. The review then notes the TRIPS flexibilities at the disposal of developing nations that could be used to facilitate a balance between the protections of intellectual property rights and the promotion of public objectives, particularly Article 27(1), Article 30 and Article 31 of TRIPS.

3.4. Patents and Clean Energy: Bridging the gap between evidence and policy

The Patents and Clean Energy Report is a joint effort between the UNEP, the European Patent Office and the International Centre for Trade and Sustainable Development (Patents and Clean Energy: Bridging the gap between evidence and policy, 2010). The report starts off with a reflection on the rise in prominence of the technology mechanism within the UNFCCC and the positions adopted by various parties on the role and implications posed by intellectual property rights in technology transfer within the Convention. It summarises the positions of developing countries and non-government organisations as compared to developed countries and business associations by stating, “*many developing countries and some non-government organisations have advocated the use and expansion of the flexibilities on intellectual property available within the WTO TRIPS Agreement such as compulsory licensing...*” whereas “*developed nations and business associations claim that only strengthened intellectual property regimes will encourage the necessary innovation, transfer and diffusion of such technologies*” (WTO, 1994).

The report evaluates a number of previous studies that have sought to clarify the importance of IPRs in climate change. From my analysis, three findings from the report seem important and fit in with the general views on IPRs in climate change:

- a) Intellectual property rights are important to attract the necessary investment, innovation and diffusion of clean energy technologies (Harvey, 2008).
- b) Many of the intellectual property rights barriers facing greenhouse gas-reducing technologies do not hold equal weight (Brown, Chandler, Lapsa & Sovacool, 2008).
- c) Consumers in developing countries may not experience specific IPR-related barriers to accessing low carbon technologies; nonetheless, they may face a cost barrier because of IPRs (Mallet *et al.*, 2009).

Interestingly, Harvey (2008) also found that most patents for clean energy technologies are not filed in least developing countries because of their small market

potential. It would be easy then to assume that this lack of intellectual property protection would pose no barriers to the practice of the related patents in these economies. However, this argument falls foul of the broader definition of technology transfer referred to by the ICTSD, and that is commonly adopted within the UNFCCC.

The impact of political decisions on patenting activities is reinforced by the Patenting and Clean Energy study. From the review of patenting data, the study was able to conclude a noticeable increase (20% year-on-year) in the patenting of selected clean energy technologies since the signing of the Kyoto Protocol in 1997. The study also confirms that patenting in selected clean energy technologies is dominated by OECD countries. However, if the data is disaggregated, non-OECD countries such as India, Mexico and Brazil also present with high citations in certain clean energy technology fields.

A component of the Patents and Clean Energy study focused on the licensing of clean energy technologies. The study found that intellectual property protection in the country of the licensee was an important factor when determining whether to enter into a licensing agreement. The importance of IPRs was found to be of greater value to licensing by respondents who participated in this aspect of the study.

3.5. Conclusion

The prominence of the role of intellectual property rights in the UNFCCC negotiations and within the broader climate change discourse is necessary to better understand the role and contribution (whether positive or negative) of the transfer of environmentally sound technologies. Whilst there are similar sentiments expressed in the three studies summarised in the preceding section, a number of challenges are also evident. Table 1 presents a comparative summary of the findings from the three reports.

Title of the report	Distinct stance on the role of IPRs in Climate Change	Reference to TRIPS	Challenges noted
Global Challenges Report: Intellectual Property and the Transfer of Environmentally Sound Technologies	Inconclusive	No	Lack of empirical evidence and need for ongoing research Need for additional platforms in support of IPRs to facilitate technology transfer
Technologies for Climate Change and Intellectual Property: Issues for Small/Developing Countries	Inconclusive	Yes (with specific articles cited)	Lack of empirical evidence and need for ongoing research Need for additional platforms in support of IPRs to facilitate technology transfer
Patents and Clean Energy: Bridging the gap between evidence and policy	Inconclusive	Yes (only in so far as context in various arguments on the role of IPRs in climate change)	Lack of empirical evidence and need for ongoing research Importance of IPRs in licensee country and to license intensive respondents when concluding licence agreements

Table 1: Summary comparison between three reports on the role of intellectual property rights in climate change

From Table 1, it is evident that greater use and application of the TRIPS flexibilities is an important consideration in advancing intellectual property rights and the transfer of environmentally sound technologies. Secondly, the fact that technology transfer encompasses more than just the passing on of technology (not a typical buyer/seller transaction) indicates that intellectual property rights are not the primary barrier towards technology transfer of clean energy technologies. All three reports confirm the need for continued empirical research to better craft a solid and

conclusive role for intellectual property rights to facilitate technology transfer within the UNFCCC.

Finally, the emergence of developing nations as intellectual property creators who themselves would be in a position to offer clean energy solutions is a growing trend. The BRICS economic classification is fast becoming a force within economic circles and the rate of industrialisation, participation in multilateral economic fora and strengthened intellectual property rights regimes within these member countries may be contributing towards this trend.

Chapter 4: The Trade-Related Aspects of Intellectual Property Agreement and Access to Medicines

4.1. Introduction

The previous chapter discussed intellectual property rights and climate change. This penultimate chapter will focus on intellectual property rights as a legal instrument and will provide a critical analysis of the TRIPS Agreement, in particular, the flexibilities in the Agreement that can be used to facilitate access to technologies that still enjoy formal intellectual property rights protection. The TRIPS Agreement is the most prominent of intellectual property agreements in force today. TRIPS builds on provisions and basic norms espoused in other conventions such as the Paris Convention for the Protection of Industrial Property, the Berne Convention for the Protection of Literary and Artistic Works, and the IPICT Treaty (Reichman, 1995).

The flexibilities in the TRIPS Agreement have been used previously on public health grounds in promoting access to medicines. I maintain that the same flexibilities can be applied to promote access to environmentally sound technologies. This chapter focuses predominantly on intellectual property rights granted under patent law. This is because patents are the primary mode of protection for clean energy technologies, and the available literature and studies reviewed in Chapter 3 focused on patents. Also, the flexibilities in TRIPS are applicable mainly to inventions regulated by patents.

The right to a clean environment is a human right. Contestably, this human right is violated in the case of vulnerable communities in a number of ways. The exposure to the effects of climate change, the causes of which cannot be attributed to these vulnerable communities, is one such way. This chapter aims to demonstrate that the fields of intellectual property law and human rights law are not mutually exclusive and should not be practised in isolation from and in conflict with one another.

4.2. Intellectual property rights

“The objective of intellectual property protection is to create incentives that maximise the difference between the value of the intellectual property that is created and used and the social cost of its creation, including the cost of administering the system” (Besen & Raskind, 1991).

Intellectual property is broadly defined as the “ *legal rights which result from intellectual activity in the industrial, scientific, literary and artistic fields* ” (WIPO, n.d.). Long (1991) interprets intellectual property as a legal concept that refers to various kinds of intangible property. The South African Intellectual Property Rights from Publicly Financed Research and Development Act, No. 51 of 2008 defines intellectual property rights as “*any creation of the mind that can be protected by law ... whether in South Africa or any other jurisdiction*” (IPR Act, 2008).

Intellectual property rights are granted under specific legal instruments which are domain-specific. The nature of the instruments may differ, but all have aspects that relate to the subject matter, extent of protection and field of application (Primo Braga *et al.*, 1998). As indicated in Chapter 1, the most common forms of intellectual property are trademarks, patents, copyright, designs and trade secrets. The Stockholm Convention of 1967 that established WIPO highlights, “intellectual property shall include rights relating to

- literary, artistic and scientific works;
- performances of performing artists, phonograms and broadcasts;
- inventions in all fields of human endeavour;
- scientific discoveries;
- industrial designs;
- trademarks, service marks and commercial names and designations;
- protection against unfair competition; and
- all other rights resulting from intellectual activity in the industrial, scientific, literary or artistic fields” (Stockholm Convention, 1967).

The classification of forms of intellectual property in the Stockholm Convention are broad enough. They remain relevant despite the emergence of new fields such as information and communication technologies, biotechnology and nanotechnology.

In South Africa, trademarks, patents, copyrights and designs are afforded statutory protection, i.e. they have a primary statute that regulates the grant of rights in this class of intellectual property. Trade secrets enjoy protection under common law principles. A new form of IPR has emerged owing to technological change and unique characteristics of certain industries such as that associated with genetic material and intellectual property derived from indigenous knowledge systems. *Sui generis* forms of IP protection refer to special purpose intellectual property protection mechanisms (Lesser, 2000). An example of a *sui generis* protection is the protection of IP related to computer chips which are protected under the Semiconductor Chip Protection Act in the United States of America (Gallini & Scotchmer, 2002). A South African example of *sui generis* legislation is the Intellectual Property Laws Amendment Act of 2013 (IP Laws Amendment Act, 2013). The IP Laws Amendment Act is *sui generis* legislation because it provides protection for intellectual property such as that from indigenous knowledge holders outside of the primary IPR domain legislation of patents, designs, and copyright, for example.

A patent for an invention is a temporary monopoly on the making, use, or selling of a piece of intellectual property (Cooper, 1991). An alternate definition for patents is provided by Primo Braga *et al.* (1998) who states that patents are a legal title granting the owner the exclusive right to make commercial use of inventions. Both these definitions provide two consistent aspects on the grant of patent rights:

- i) the exclusivity granted to the patent holder; and
- ii) the legal standing conferred on a patent holder.

The South African Patents Act defines a patent as “*a certificate in the prescribed form to the effect that a patent for an invention has been granted in the Republic*”. Section 45(1) of the Act details the effects of a patent as being “*to grant to the patentee in the Republic, subject to the provisions of this Act, for the duration of the*

patent, the right to exclude other persons from making, using, exercising, disposing or offering to dispose of, or importing the invention, so that he or she shall have and enjoy the whole profit and advantage accruing by reason of the invention". The definition and effect of a patent read together in the South African Patents Act are consistent with the definitions espoused by Cooper (1991) and Primo Braga *et al.* (1998). It is important to note that the above effects apply to all inventions that meet the minimum criteria for patentability subject to any exclusion that may be delineated in respective patent legislation. Patents on clean energy technologies, therefore, grant the same rights.

Patents are territorial in nature, and an invention must fall within the subject matter defined by the patent legislation of the country in which patent protection is sought. In addition, there are three basic principles that are almost universal and that have to be met by an invention in order for it to qualify for patent protection. For an invention to be patentable, it must possess a minimum degree of (i) non-obviousness, (ii) usefulness, and (iii) novelty (Hasson, 2002). There is no such thing as a universal patent. WIPO, through the Patent Corporation Treaty (PCT), provides a standardised and converged process for the application of patent rights in multiple jurisdictions, but the grant of a patent is still dependent on the laws of each state in which patent protection is sought. The PCT was concluded in 1970 and came into effect in 1978 (Boutillon & Erstling, 2005). The PCT application process is a two-phased process with international and national phases.

Whilst previously they were regulated solely by national laws, intellectual property rights are now managed in accordance with various international prescripts. The most prominent of these is the TRIPS Agreement, under the WTO, which is discussed in more detail in the next section.

4.3. Trade-Related Aspects of Intellectual Property Rights Agreements

The TRIPS Agreement was negotiated at the WTO in 1994 under the Uruguay Round of negotiations. The TRIPS Agreement was a major milestone in the convergence of interests between trade and intellectual property. The Agreement starts off with the statement that members of the WTO *“desiring to reduce distortions and impediments to international trade, and taking into account the need to promote effective and adequate protection of intellectual property rights, and to ensure that measures and procedures to enforce intellectual property rights do not themselves become barriers to legitimate trade”* (WTO, 1994). This is a clear and direct pronouncement between the link in the exercise of intellectual property rights and their application in trade. Fundamentally, the TRIPS Agreement was an international assertion and formal recognition of *“the need to promote effective and appropriate means for the enforcement of intellectual property rights and provide for expeditious procedures for the multilateral prevention and settlement of disputes relating to private intellectual property rights”* (Hasson, 2002).

Prior to TRIPS, intellectual property was more along legal principles with less emphasis on its application in trade. This is notwithstanding recognition in national patent laws for instance, whereby the grant of a patent is dependent on three criteria of patentability, one of which is application in trade. Important also is the fact that TRIPS is administered by the WTO, the primary global organisation regulating trade between countries. By comparison, if TRIPS were to be administered by WIPO, it would be easier to align the efforts of scientific endeavour, which generate intellectual property rights, with human rights interests. As stated on their website WIPO *“is the global forum for intellectual property services, policy, information and cooperation”*. The website further affirms that, WIPO provides:

- *“a policy forum to shape balanced international IP rules for a changing world;*
- *global services to protect IP across borders and to resolve disputes;*
- *technical infrastructure to connect IP systems and share knowledge; and*
- *cooperation and capacity-building programmes to enable all countries to use IP for economic, social and cultural development”* (WIPO, n.d.).

The last point requires further reiteration in the context of the environment as a solidarity class of human rights recognised in the ICESCR.

At the highest level, the TRIPS Agreement provides minimum standards which national governments of member states of the WTO need to grant to specific domains of intellectual property. The minimum standards for patents that are set in the TRIPS Agreement include:

- a) Members having the right to exclude from patentability those inventions which the “*commercial exploitation thereof is necessary to protect ordre public or morality, including to protect human, animal and plant life or health, and to avoid serious prejudice to the environment, provided that such exclusion is not made merely because the exploitation is prohibited by their law*” (Article 27).
- b) That a patent shall be valid for a period of 20 years from date of filing (Article 33).
- c) The principle of national treatment – non-discrimination against foreign rights holders (Article 3).
- d) The most favoured nation principle which serves to prevent one member state from providing better standards of protection to a second state (better than provided for by international law) and then denying the same privilege to another state.
- e) The need to afford nationals of other member states the minimum international protection standards as set out in the TRIPS Agreement (Article 4) (WTO, 1994).

With the aforementioned minimum standards, the TRIPS Agreement fills many gaps in the international patent system (Reichman, 1995). However, because of them being consistent with practice in the developed world, TRIPS may be more favourable to these already established economies but be prejudicial towards developing and least developed nations. The delay that was afforded for implementation does, however, reflect an understanding of the necessary policy amendments, drafting of legislation and infrastructure development that would need

to be undertaken to become TRIPS compliant. Ethically, the adoption of TRIPS may be reviewed from the perspective of justice, particularly the notion of equity. The three justifications presented by Shue (2012) of this notion of equity are (1)

“justification of unequal burdens intended to reduce or eliminate the existing inequality by removing an unfair advantage of those at the top; (2) justification of unequal burdens intended to prevent the existing inequality from becoming worse through any infliction of an unfair additional disadvantage upon those at the bottom; and (3) justification of a guaranteed minimum intended to prevent the existing inequality from becoming worse through any infliction of an unfair additional disadvantage upon those at the bottom”. These justifications are key aspects that need review as to the equitable scope of the TRIPS Agreement.

The TRIPS Agreement is binding on all members of the WTO, and once assented to, all members would need to ensure that their national intellectual property laws comply with the minimum standards set in the TRIPS Agreement. By imposing certain minimum standards of intellectual property protection, for instance, the TRIPS Agreement made it mandatory for such states to recognise patents for pharmaceutical products to the extent that the products meet the criteria for patentability (Owoeye, 2013).

In keeping with its economical rudiments (the agreement being on the trade-related aspects of IPRs and recognising IPRs essentially as a tool of trade), the TRIPS Agreement distinguishes amongst member states in line with the level of their economic development. Article 65 of the Agreement introduced transitional arrangements for developing and least developed country members. Developing states were allowed a period of four years to implement the provisions of the agreement, with least developed members having up to 10 years for implementation. The transitional arrangements of TRIPS excluded Articles 3, 4 and 5 which were to be effected in all member states within 12 months from the date of signature of the WTO agreement (to which TRIPS forms annexure 1C). Furthermore, least developed states could seek extensions from the Council for TRIPS on the basis of recommendation (WTO, 1994).

An important aspect of the TRIPS Agreement are the exceptions to patents cited in Articles 30 and 31. Article 30 confers exceptions to the exclusive rights of a patent holder provided such exceptions do not unreasonably conflict with the normal exploitation of the patent. Many countries have introduced this exception into national patent legislation, particularly for research and development purposes. For instance, section 27(e)(1) of the Drug Price Competition and Patent Term Restoration Act (informally known as the Hatch-Waxman Act) of the United States of America provides that “*it is not an act of infringement to make, use, offer to sell, or sell within the United States or import into the United States a patented invention solely for uses reasonably related to the development and submission of information under a federal law that regulates the manufacture, use, or sale of drugs or veterinary biological products*” (Drug Price Act, 1984). South Africa and Canada along with several other jurisdictions refer to similar provisions in their domestic patent legislation such as the Bolar Provisions recognising the case of *Roche Products v. Bolar Pharmaceutical*. In the case of *Roche Products v. Bolar Pharmaceuticals*, “the district court held that Bolar’s use of the patented compound for federally mandated testing was not an infringement of the patent in suit because Bolar’s use was *de minimis* and experimental” (*Roche Products Inc v. Bolar Pharmaceuticals*, 1984). Whilst the decision of the district court was reversed and remanded by the United States Court of Appeals, Federal Circuit, the case holds as the legal test of the provisions of Article 30 of TRIPS.

Article 31 of TRIPS provides for the grant of compulsory licences provided certain conditions are met. A compulsory licence may be granted to authorise the production of a patented product or the use of a patented process without the patent holder’s consent under specific conditions. According to the TRIPS Agreement, compulsory licences may be granted where:

- (a) “*authorisation of such use shall be considered on its individual merits;*
- (b) *such use may only be permitted if, prior to such use, the proposed user has made efforts to obtain authorisation from the right holder on reasonable commercial terms and conditions and such efforts have not been successful within a reasonable period of time;*

- (c) the scope and duration of such use shall be limited to the purpose for which it is authorised;*
- (d) such use shall be non-exclusive;*
- (e) such use shall be non-assignable, except with that part of the enterprise or goodwill which enjoys such use;*
- (f) such use shall be authorised predominantly for the supply of the domestic market of the Member authorising such use;*
- (g) the right holder shall be paid adequate remuneration in the circumstances of each case, taking into account the economic value of the authorisation; and*
- (h) the legal validity of any decision relating to the authorisation of such use shall be subject to judicial review or other independent review by a distinct higher authority in that Member ” (WTO, 1994).*

The above-mentioned clauses (and others in Article 31) have been used primarily in the protection of human rights in seeking access to life-saving medicines such as anti-retroviral therapy for the human immunodeficiency virus and acquired immune deficiency syndrome (HIV/AIDS). The compulsory licence provisions are not limited and can be used across different technology sectors including technologies relevant to climate change adaptation and mitigation (as applicable) and provided other aspects of the TRIPS Agreement are not violated.

4.4. Intellectual property rights and human rights

As part of the fundamental human right to health services, the role of intellectual property rights in the realisation of access to medicines has been tested within the ambit of the TRIPS Agreement of the WTO (Khor, 2007). The literature is rich in reflecting the relationship between intellectual property rights and human rights. Chapman (1998) contends that IPRs seek to balance the moral and economic rights of creators and inventors with the interests and needs of society. This human rights-based approach to intellectual property rights is emphasised by the Committee on Economic, Social and Cultural Rights (ESCR), where in its 2001 statement, the Committee argued, *“intellectual property protection must serve the objective of human well-being which is primarily given legal expression through human rights”* (Cullet, 2004). Likewise, Helfer (2003) identifies *“two approaches to the human rights intellectual property interface, with the second approach seeing both areas of law as being concerned with the same fundamental question: defining the appropriate scope of private monopoly power that gives authors and inventors sufficient incentive to create and innovate whilst ensuring that the consuming public has adequate access to the fruits of its efforts”*.

Intellectual property rights are recognised in the UDHR. Several rights espoused within the UDHR relate to matters and content that are protected under specific domains of intellectual property. Article 27(1) of the UDHR provides, *“Everyone has the right to freely participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits”*. Article 27(2) of the UDHR grants everyone the right to *“protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author”*. Whilst not making explicit reference to intellectual property ownership, it is implied as the protection of literary, scientific and artistic work which fall within the domain of intellectual property rights.

The rights in the UDHR are further developed in the ICCPR of 1966 and the ICESCR of 1966 (Drahos, 1999). Article 15(1) of the United Nations ICESCR contains similar provisions to the UDHR: *“The States parties to the present Covenant recognise the right of everyone: (a) to take part in cultural life; (b) to enjoy*

the benefits of scientific progress and its applications; (c) to benefit from the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he or she is the author ” (ICESCR, 1966). The recognition of the right to enjoy the benefits of one’s intellectual and creative effort (intellectual property rights) is clearly a fundamental tenet of the right to liberty and freedom. There is a consistent thread that can be traced through the first and second generation of human rights. The right to freedom is augmented with the rights expressed in Article 15(1) of the ICESCR.

Mylly (2007) avers that the relationship between intellectual property rights and fundamental rights is often seen as overly simplistic. There are two standard simplistic variations. The first sees intellectual property rights as human rights in themselves and/or overemphasises the property character of intellectual property rights at the expense of other fundamental rights. The legal aspects of property rights within international law are too broad for the purposes of this report. That being said, Schermers cited by Blakeney (2009: 16) concludes that property rights cannot be included in the category of fundamental human rights as “...*human rights are of such importance that their international protection includes the right, perhaps even the obligation, of international enforcement*”. This hierarchical delineation of human rights presents a fundamental distinction between those rights that are essential to human existence and survival and those that primarily serve to enhance the quality of enjoyment of human rights (*my emphasis*). At the heart of the debate on intellectual property rights and human rights lies a distinction between individual rights and community rights (Matthews, 2009). It is my view that the invocation of the compulsory licence provisions under TRIPS on granting access to medicines was premised to a large degree on Schermers’ observation cited above and the distinction between individual and community rights. Public health concerns and situations cannot be exacerbated by lack of access to critical therapeutics simply because these are still under patent protection. Even within TRIPS, under the Doha Round of negotiations, WTO issued a declaration on the TRIPS Agreement and Public Health. Paragraph 4 of the Declaration states, “*we affirm that the Agreement can and should be interpreted and implemented in a manner supportive of WTO Member’s right to protect public health and, in particular, to promote access to*

medicines for all" (WTO, 2001). Public health concerns and related community rights, therefore, supersede the individual rights of intellectual property rights holders notwithstanding their right of entitlement to equitable compensation for the use of their intellectual property.

4.5. Conclusion

The notion of intellectual property rights as a subset of human rights is supported and aligns with Article 27(1) and (2) of the UNDHR. My view is that, the stated conflicts between human rights law and intellectual property law are not brought about by the respective statutes and treaties that regulate these different fields of law but rather by an implementation approach that distinguishes each of these fields of law as exclusive rather than adopting complementary and mutually reinforcing models of implementation.

The flexibilities presented to developing countries in the TRIPS Agreement are not limited for use in the granting of access to medicines. The provisions are broad enough to extend to other areas where the application of intellectual property rights infringes on the basic human rights that should be enjoyed by all people. Parallels may be drawn between the gravity of the potential negative impact of climate change on health and the significance of a lack of access to life-saving medicines in the past.

The effects of climate change are not confined by political borders, and therefore, mechanisms directed towards adaptation and mitigation against the effects of climate change cannot be confined by laws that perpetuate this fallacy and by implication extend to an infringement of basic human rights to a clean environment and protection from environmental degradation. I submit that there are no limitations to the extension of Articles 30 and 31 of TRIPS to apply to environmentally sound technologies. The application of non-environmentally sound options that are cheaper and not under patent protection but that could exacerbate the contribution to GHG emissions and accelerated climate change should not be seen as the easier option. The effects of climate change present a potential plethora of human rights violations. The two spheres of law, i.e. intellectual property and human rights, cannot continue to operate in conflict.

Chapter 5: Discussion and Conclusion

5.1. Introduction

The penultimate chapter discussed the TRIPS Agreement and access to medicines. This final chapter will provide a discussion as well as the conclusion of the study.

As far as human rights law is concerned, intellectual property law interface is inevitable owing to the coexistence in practice and application of the two fields of law. The fields of intellectual property law and human rights law are not mutually exclusive and can and should coexist.

The intent of the establishment of intellectual property rights and patents, in particular, was meant to be a way of disseminating information and providing a means by which the invention in a patent could be practised. Human rights serve to protect the fundamental tenets of human existence and freedoms. As a class of rights, they recognise the intrinsic value of every human being irrespective of gender, race, colour or creed. Human rights are non-discriminatory. The application of the intellectual property rights regime as an incentive to inventors and creators cannot be exercised in a manner that prejudices fundamental human rights. The right to enjoy intellectual property protection is in and of itself a human right. The beauty of human rights is their universality, and the enjoyment of the right by any person should not infringe on the human rights of another.

The right to a clean and healthy environment is arguably a human right, although within the third generation of so-called sodality rights. The effects of climate change are characterised by dispersion of cause and effects fragmentation of agency and institutional inadequacy (Gardiner, 2006). All three of these dimensions require that the application of the intellectual property rights system in response to climate change not be framed around *“analytical tools of utilitarianism and welfare economics to evaluate the trade-offs between incentives and access and consequences for the individuals and firms that create, own and consume intellectual property products”* (Helfer & Austin, 2011; 504). The conceptual relationship between

human rights and intellectual property rights must be framed differently in full recognition of the ethical dilemma posed by climate change. The application of intellectual property law to protecting environmentally sound technologies that could mitigate or adapt for climate change must be done in a manner that recognises the right to a healthy and clean environment as a third class of human rights; the interplay between the environment and quality of life; and dispersion of human rights between intellectual property rights holders and society at large. *“Intellectual property rights must be consistent with the understanding of human dignity in various international human rights instruments and, in the instance of science endeavour, should promote scientific progress and access to its benefits”* (Chapman, 1998).

Helfer and Austin (2011) further propose a human rights framework for intellectual property that distinguishes between protective and restrictive dimensions of human rights in the intellectual property context. The protective dimension encourages the recognition and respect of the rights of individuals and groups to a degree of moral and economic benefit from their creative and innovative activities. The converse restrictive approach identifies the conditions under which the realisation of a specific right or freedom can be enjoyed. Considering that human existence is dependent on the state of the environment, there is plausibly sufficient ground to curtail the individual rights of intellectual property owners of environmentally sound technologies for the broader benefit of society. Balance should be struck between the individual interests of inventors and creators with the broader societal interests and needs. Best practice framed around human rights realisation is required. Best practices in intellectual property management should include creative licensing practices that ensure global access and affordability and improved institutional intellectual property management capabilities (Krattiger, 2007).

It needs to be borne in mind, however, that the curtailment of IPRs alone will not suffice in addressing the ethical imperatives that should drive the response to climate change. Access to funding, the protection of vulnerable communities, health and well-being, food security economic infrastructure and legislative environments that are underpinned by the realisation that the earth is endangered by an escalating global environmental crisis should all be dealt with.

5.2. Discussion

It has been recognised throughout this research report that there are several constituent factors necessary for the realisation of the full technology transfer ambitions of the UNFCCC. Key amongst these is the role of intellectual property rights in the transfer of environmentally sound technologies.

There exists no material ground for the persistent practice of human rights law and intellectual property law as being distinct and separate from each other. The two fields of practice are also not mutually exclusive. A human rights-based approach to intellectual property management must distinguish between protective and restrictive dimensions of human rights in the intellectual property context. Arguments for and against either should not be framed in concrete and absolute terms but rather recognise the interrelatedness and interdependency between the two. This interdependency and inter-relatedness are brought to the fore mainly when dealing with matters that invoke substantive ethical positions such as access to medicines and conservation and protection against the harmful effects of climate change.

The TRIPS Agreement provides flexibilities that enable the humanitarian practice of intellectual property rights. These flexibilities have been used previously to enable the granting of critical, life-saving medicines that were still under patent protection. It is suggested that the same flexibilities can and should be used to facilitate access to environmentally sound technologies in least developed and developing countries. Climate change is debatably the biggest crisis facing humanity today. Its effects will have lasting effects that will have an impact not only today but on future generations as well. Intellectual property rights as a decisive factor amongst parties that participate in the UNFCCC must be dealt with decisively and with full appreciation of the humanitarian crisis posed by climate change effects, particularly to the most vulnerable. The aspirations of the UNFCCC of common but differentiated responsibility to adapt to and mitigate against climate change can only be realised through recognition of the ethical imperatives of distributive and participatory justice in responding to the challenges of climate change. In its ideal mode of operation, the UNFCCC would be a sterling example of participatory justice whereby the interests of even the most vulnerable and disempowered are equally represented and taken

into account in adopting actions on climate change. On the question of distributive justice, whilst contentious, in reality, the affluent North should be held to account for and contribute largely to a climate change response. Whereas human-influenced greenhouse gas emissions have existed since time immemorial, the consensus is that these emissions have increased significantly through industrialisation, the bulk of which have been contributed to by the Northern hemisphere.

5.3. Conclusion

This research report is concluded by affirming the relationship between human rights, intellectual property and climate change. Any meaningful response to climate change will only be achieved by embracing the need for interdisciplinary cooperation between science, law, economics and ethics. Individually, none of these fields of practice will adequately attend to the crisis posed by climate change.

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