INTELLECTUAL PROPERTY LAW, FOOD AND AGRICULTURAL LAW AND FOOD SECURITY: THE CASE OF SOUTHERN AFRICA

by

GEBREHIWOT TIGIST DESSU

THESIS

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Supervisor: Prof Steve Cornelius
Professor of Intellectual Property Law, University of Pretoria
Co-supervisor: Prof Lise Korsten
Professor of Plant and Soil Sciences, University of Pretoria

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Finally, my gratitude to all the authors out there whose textbooks and writings I used during the writing of this research.

DECLARATION

I, Gebrehiwot Tigist Dessu, hereby declare that the research in this thesis, the conclusions and recommendations contained herein, is my original work and it has not been previously submitted for the award of a degree at this or any other tertiary institution. All the sources I have used or quoted have been indicated and acknowledged as complete references.

ABSTRACT

This thesis is written with the purpose of answering three basic questions: Is the current intellectual property (IP) law capable of facilitating and supporting the goal of ending hunger and increasing food security? Will the current international food law promote fair and equitable food production and supply practices to benefit all who need it and will the existing international food law including IP, create incentives for farming practices that are ecologically sound as well as culturally and socially appropriate?

The Southern African communities, in particular the San communities, will be used as a classic case study to highlight the reality experienced in developing countries under existing international food systems and IP law. The study will analyse the law by using this case study that will allow the comprehension of the law, the behaviour of society and the outcome in the application of the law in real life experience. This enables us to identify the gap created in the law addressing food security.

The analysis deals with the interface between IP law and food control, as well as international conventions and treaties governing food and agriculture. This study will promote a better understanding of how the international food systems affect the future of food security exposing the fragility of the system. Furthermore, this study will summarise the negotiations that led to the formulation of various multilateral systems including IP dealing with food and agriculture.

After providing the background to the current IP law and international food law addressing food security, the way in which the current international food law influences food security is analysed. It is argued that the existing international food and IP law approach to food security

has created a gap and impacted on broader food security, making it difficult for small level agribusinesses to cope and compete in the midst of global economic change. The study will further illustrate the negotiations that have led to the formulation of various multilateral systems, including IP, dealing with food and agriculture.

It is argued that the primary failing of the current global food systems in addressing food security is of great concern and should be addressed with urgency and a high level of commitment and political will. Negotiations on agriculture and food in various international forums should take some responsibility for the lack of transparency, commitment and consistency within its member states. Subsequently the historical disadvantaged position of developing countries to negotiate more favourable terms in international treaties governing food and agriculture is important and should be critically analysed to develop a more sustainable solution for food security.

In order to resolve these issues, it is argued that appropriate reform is required to ensure distributive justice for all. The various international institutions and organisations should reform by giving developing countries an opportunity to play an active role in shaping the future to determine the prospect of global food security.

KEYWORDS

Access and Benefit Sharing Agreement

Acting Body of the ITPGRFA

Ad Hoc Technical Expert Group

Agreement between FAO

Agreement on Trade-related Aspects of Intellectual Property

Agriculture

Biological Technology

Bonn Guidelines on Access to Genetic Resources and the Fair and Equitable Sharing of the Benefits Arising from the Utilization of GRs and associated TK (2002)

Convention on Biological Diversity

European Patent Convention (1973)

Food Control

Food Sovereignty

Food Security

Free Trade Agreement (2000)

Genetic Resources

Gross Domestic Product

Innovation

International Convention for the Protection of New Varieties of Plants (1961), (1972) and (1991)

International Covenant on Economic, Social and Cultural Rights (1966)

International Intellectual Property Regime

International Treaty on Plant Genetic Resources for Food and Agriculture (2001)

International Undertaking on Plant Genetic Resources (1983)

Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity (2010)

Patent

Paris Convention for the Protection of Industrial Property (1883)

Plant Variety

Plant Variety Protection Act (1970) as amended (1994)

Protocol on Bio-safety to the Convention on Biological Diversity (2000)

Right to Food

South African Constitution (1996)

The Centre of the CGIAR (2007)

Traditional Knowledge

Trade

United Nations

UN Declaration on the Right of Indigenous Peoples (2007)

Universal Declaration of Human Rights (UDHR) 1949

United States of America Plant Patent Act (1930)

World Intellectual Property Organisation

World Trade Organisation

NOTE ON ARTICLES PRESENTED AT INTERNATIONAL CONFERENCES AND SUBMITED FOR PEER REVIEW

The following list represents articles which I have presented at International Conferences and intend to publish.

1. Tigist Gebrehiwot – 'Intellectual Property Law, Food Control and Food Security: The Case of Southern Africa.' Presented at the International Colloquium on Current Issues in Agricultural Law in a Global Perspective at The Scuola Superiore Sant'Anna Pisa, Italy, 17-18 September 2015.

2. Tigist Gebrehiwot – 'The Impact of Regional Trade Agreements in Africa Addressing Food Security: Case Study Eastern and Southern Africa.' Presented at the AgLaw Colloquium on 'Agri-Food and Environmental Regulatory Agenda in Regional Trade Agreements: Legal Implications and Trends,' Pisa, 20-21 October 2016.

3. Tigist Gebrehiwot – 'Patents and Biotechnology Predicament: Case Study Southern Africa and India' (2017).

4. Tigist Gebrehiwot – 'Impact of Global Food and Agriculture Law on Africa's Food Security' (2017).

The above conference proceedings were used in this thesis in support of arguments and are referenced as such.

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LIST OF ABBREVIATIONS AND ACRONYMS

ABS	Access and Benefit Sharing
AOA	Agreement on Agriculture
AHTEG	Ad Hoc Technical Expert Group
BIRPI	United International Bureaux for the Protection of Intellectual Property
CBD	Convention on Biological Diversity
CGIAR	Consultative Group on International Agricultural Research
CGRFA	Commission on Genetic Resources for Food and Agriculture
COP	Conference of the Parties
DAFF	Department of Agriculture, Forestry and Fishery
EC	European Commission
EPC	European Patent Convention
EPO	European Patent Office
EU	European Union
FAO	Food and Agriculture Organisation
FTAs	Free Trade Agreements
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GFAR	Global Forum on Agriculture Research
GM	Genetically Modified
GMOs	Genetically Modified Organisms
GRs	Genetic Resources

GRAIN	Genetic Resources Action International
GRTKF	Genetic Resources, Traditional Knowledge and Folklore
IARCs	International Agricultural Research Centres
IBC	Institute of Biodiversity Conservation
IBPIP	International Bureaux for the Protection of Intellectual Property
ICESCR	International Covenant on Economic, Social and Cultural Rights
IGC	Intergovernmental Committee on Intellectual Property
IGWG	Intergovernmental Working Group
ILCs	Indigenous Peoples and Local Communities
ILO	International Labour Organisation
IP	Intellectual Property
IP5	Five Intellectual Property Offices
IPER	Intellectual Plant Genetic Resources Institute
IPRs	Intellectual Property Rights
ISF	International Seed Federation
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
IU	International Undertaking
IUCN	International Union for the Conservation of Nature
IUPGR	International Undertaking on Plant Genetic Resources
LDC	Least-developed Country
MDGs	Millennium Development Goals
MFN	Most-favoured Nation
MLS	Multilateral System of Access and Benefit Sharing
NGO	Non-governmental Organisation
NRDC	Natural Resources Defence Council
OAU	Organisation African Unity

PBRs	Plant Breeder's Rights
PCT	Patent Corporation Treaty
PGR	Plant Genetic Resources
PGFA	Plant Genetic Resources for Food and Agriculture
PIC	Prior Informed Consent
PIPRA	Public Sector Intellectual Property Resources for Agriculture
PLT	Patent Law Treaty
PPA	Plant Protection Act
PVP	Plant Variety Protection
PVPA	Plant Varieties Protection Act
PVR	Plant Variety Rights
R&D	Research and Development
TCEs	Traditional Cultural Expressions
TK	Traditional Knowledge
TNC	Trade Negotiations Committee
TRIPS	Trade-related Aspects of Intellectual Property Rights
UN	United Nations
UNCITRAL	United Nations Commission on International Trade Law
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNESCO	United Nations Educational and Scientific Organisation
UNGA	United Nations General Assembly
UDHR	Universal Declaration of Human Rights
UPOV	Protection of New Varieties of Plants
US$	United States Dollar
USA	United Sates of America

USDA	United States Department of Agriculture
USPTO	United States of Patent and Trademark Office
UNDP	United Nations Development Program
WIPO	World Intellectual Property Organisation
WSSD	World Summit on Sustainable Development
WTO	World Trade Organisation

LIST OF INTERNATIONAL TREATIES AND CONVENTIONS

- Agreement on Trade-related Aspects of Intellectual Property Rights (1994)
- Agreement between FAO, acting Body of the ITPGRFA, and the Centre of the CGIAR (2007)
- Bonn Guidelines on Access to Genetic Resources and the Fair and Equitable Sharing of the Benefits Arising from the Utilization of GRs and associated TK (2002)
- Convention on Biological Diversity (1992)
- European Patent Convention (1973)
- Free Trade Agreement (2000)
- International Convention for the Protection of New Varieties of Plants (1961), (1972) and as revised at Geneva 19 March (1991)
- International Covenant on Economic, Social and Cultural Rights (CESCR) (1966)
- International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) (2001)
- International Undertaking on Plant Genetic Resources (IUPGR) (1983)
- Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity (2010)
- Paris Convention for the Protection of Industrial Property (1883)
- Protocol on Bio-safety to the Convention on Biological Diversity (2000)
- South African Constitution of 1996
- UN Declaration on the Right of Indigenous Peoples (2007)
- Universal Declaration of Human Rights (UDHR) 1949

- United States of America Plant Patent Act (1930), Plant Variety Protection Act (1970), as amended (1994)

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CHAPTER 1

CHAPTER 1

Background and Basis of the Study

1.1 INTRODUCTION

This thesis considers the current collective understanding of research on the rights conferred by Intellectual Property (IP) law on the agricultural industry concerning innovation and international food and agricultural law in promoting food security. The thesis aims to answer the question in a trans-disciplinary manner by linking knowledge platforms between the main disciplines of agriculture, economics and law. It uses the understanding of international food law and its governance to examine a holistic and equitable approach to IP, biotechnology, traditional knowledge (TK) and genetic resources (GRs).

The developed world has an advanced national and regional food and agriculture legal system in contrast to that existing in Africa. In the absence of national or regional appropriate food law in Africa, the thesis will focus on international food and agricultural law, its scope specifically

focused on food security. The thesis uses the legal theory as an instrument of analysis as well as specific topics of significance in relation to food security. To answer the question of what food and agricultural law are and to help the readers to understand the difference from the outset, the following is important: Although the two are often entangled, each has its own peculiarities[1] food law covers food trade, food safety and food security[2] while agricultural law covers the legal aspect of food production and includes everything related to farming.[3] To be specific, the food and agricultural law discussed in this thesis is that adopted by the United Nations and the World Trade Organisation. Food and agricultural law in Africa is almost non-existent. In the absence of national or regional food law, the international food law could be utilised where it is necessary. International law generally is applicable in countries that have ratified it or acceded to it.

The thesis will further investigate the application of IP law on food and agriculture and its effect on food security. Its primary focus is to address the question of how this allocation of rights conferred by IP law on food and agriculture ensures the right to food. The measure of the effectiveness of existing international food and agricultural law in safeguarding biodiversity and promoting food security will be discussed throughout this thesis.

The analysis will consider the universality of IP regimes that govern the present and future food systems. Thus, the evaluation of how seeds are transferred, how the benefits are shared,

[1] B van der Meulen *Private food law: Governing food chains through contract law, self-regulation, private standards, audits and certification schemes* (2011) 33.

[2] *Ibid.*

[3] *Ibid.*

the legal entitlements to manage and control food, are of vital importance. The constraint of IP law determines the legitimacy of the legal entitlement to control food. Therefore, the 'right to food' is an important matter, which has to be addressed.

The current international food systems have been widely criticised for failing to end hunger. This has most often been attributed to the existing systems that are not consistent and not well coordinated to respond to food insecurity. This thesis not only covers the problem relating to international food law, but also touches on the influence of various international organisations and institutions that have hosted the adoption of these systems.

The objective of this thesis is to suggest how various regulations governing food and agriculture and IP law need to be well coordinated and supportive of one another in order to address the current global food crisis. This thesis aims to contribute to this improvement.

The theoretical basis of the study and the historical background will be briefly illustrated and explained to enable readers to grasp the contents of this study. The discussions will contextualise these terms in order to facilitate a better understanding of the subject matter.

The theoretical basis of this study originates from a quote by **Borlaug** which states:

> Civilization as it is known today could not have evolved, nor can it survive, without an adequate food supply. Yet food is something that is taken for granted by most world leaders despite the fact that more than half of the population of the world is hungry.[4]

In Africa hunger has been prevalent for centuries with no solution at hand. So far, unless a new mechanism is created, the entire attempt to tackle food insecurity is in vain.[5] The norms, which administer food supply and production play a major role in food security, but are often neglected during investigations. The World Hunger and Poverty Facts and Statistics stated in 2014 that almost one billion people globally are affected by hunger,[6] of which the majority are Africans.[7]

Amartya Sen stated the following: 'The contemporary age is not short of terrible and nasty happenings, but the persistence of extensive hunger in a world of unprecedented prosperity is surely one of the worst.'[8]

The above statement is supported by the fact that the world's food production per capita has increased steadily providing enough food for everyone.[9] The concentration of ownership of

[4] N Borlaug *The Nobel peace prize* (1970).

[5] The range of possible IP impacts on food security identified here draws on an extensive and wide range of readings, for which I apologise.

[6] *World hunger and poverty facts and statistics* http/www.worldhunger.org (accessed 21 Apr 2015).

[7] *Ibid*.

[8] A Sen *Development as freedom* (1999) 204. On this page he further state that what makes this widespread hunger even more of a tragedy is the way we have come to accept and tolerate it as an integral part of the modern world, as if it is a tragedy that is essentially unpreventable.

[9] http://www.worldhunger.org.

food in the hands of the minority has subsequently created an imbalance in the accessibility of food.[10]

Wendell Berry said: 'What is the right thing to do if we want to continue living on this earth peacefully?'[11]

This question is important because poor food policy could lead to over-exploitation of knowledge and resources, further degradation of the environment, food insecurity and trade war. All of this has a tendency to ignite political violence, conflict, migration and crime. Currently people's desperation for food and fear of possible shortage has created worldwide unrest and uncertainty.[12]

This study will use the Southern Africa, particularly the San communities, their experience of the current IP law and international food system, as a classic case study. This will provide insight in understanding the law, the behaviour of society and the outcome in the application of the law in real life. The significance of the chosen communities identified in this paper and justification for choosing these communities will be discussed throughout this paper.

[10] G Tansey & T Rajotte *The future control of food: A guide to international negotiations and rules on intellectual property, biodiversity and food security (2009)* xi.

[11] W Berry (2013). See http//www.grist.org/ (accessed 21 Apr 2015).

[12] This assessment is consistent with the report: *http://www.telesurtv.net. The report on climate change will cause food Shortage civil unrest* (2015). Climate change will make global food shortages three times more likely, causing potential civil unrest in low-income countries as a result of production shocks and price hikes, according to a report by the Task Force on Extreme Weather and Global Food System Resilience. (accessed 21 Aug 2015).

1.2 DEFINITION OF INTELLECTUAL PROPERTY AND ITS HISTORICAL BACKGROUND

This section gives a very broad overview of IP law. In this section I attempt to define and introduce the historical foundation of IP law and try to highlight the connection between IP law and food security.

IP law protects intellectual property rights (IPRs). Furthermore, it provides legal and institutional procedures to protect the creations which originate from an individual's mind. These include new inventions, works of art, literature and designs.[13]

The World Intellectual Property Organisation (WIPO) is the specialised United Nations (UN) agency whose mandate is to promote and administer international IP systems.[14] WIPO defines IP as follows:

'The legal rights which result from intellectual activity in the industrial, scientific, literary and artistic fields.'[15]

The World Trade Organisation (WTO) utilises the following definition for IP:

'The rights given to people over the creations of their minds.'[16]

[13] This description draws from the description of World Intellectual Property Organisation.

[14] A Prasad & A Agarwala *Copyright law desk book: Knowledge, access and development* (2009) 150.

[15] *About IP*. http://www.wipo.int/ (accessed 5 Mar 2015).

[16] *IP*. http://www.wto.org (accessed 5 Mar 2015).

The concept of the creations of people's minds, as mentioned above, was already recognised as property by the 16th Century.[17] In fact, in 500 BC, the Greek government officially recognised IP and granted a one-year patent right to individuals who discovered new, sophisticated, fashionable and extravagant creations.[18]

Between 1558 and 1603 Queen Elizabeth I patented exclusive rights for advancing her intent to monopolise the economic and industrial policies of the time.[19] Furthermore, in 1867, IP protection was granted for the first time in Germany in the founding constitution of the North German Confederation.[20]

When the Berne Convention established the administrative secretariat in 1883, they also adopted the term IP. This Confederation later united with other nations to form the United International Bureaux for the Protection of IP (IBPIP).[21] In 1967, when WIPO was established, it succeeded the United IBPIP. WIPO was established by treaty as an agent or body of the UN.[22]

[17] C Anthon *A classical dictionary.* This book contains an account of the principles and proper names mentioned by ancient authors and elucidate all the important points connected with the geography and history which is important for this discussion.

[18] *Ibid.*

[19] A Mossoffa *Rethinking the development of patents: An intellectual history* 1500-1800 (2001). *Hasting Law Journal* vol 52 1255.

[20] Art 4 no 6 of the 1867 *Constitution of Germany* (The Rhine Confederation until today) http://www.verfassungen.de (accessed 6 Mar 2015).

[21] *Ibid.*

[22] http://www.wipo.int.

1.3 FOOD

Borlaug states that: *'Food is the moral right of all who are born into this world.'*[23]

Food sustains life, provides energy and promotes growth. Sufficient food at all times is vital for human survival. Food scarcity not only threatens life, but also affects the literacy rate and socio-economic power. Malnutrition, for example, negatively affects unborn children, limits development and leads to a low rate of literacy and eventually work security.

The legal meaning of 'food' as defined in terms of the Federal US Food and Drug Administration Statute is the following:[24]

> Food is any substance that is usually composed of carbohydrates, fats, proteins and water. It can be eaten or drunk by any animal including humans for nutrition. Most of the foods are of plant or animal origin.

The European Food law Regulation EC No 178/2002 defines food in the following terms:[25]

> Foodstuff means any substance or product whether processed, partially processed or unprocessed, intended to be ingested by humans including drink.

This thesis is limited to food that is edible by humans only.

1.4 THE INTERACTION BETWEEN FOOD AND INTELLECTUAL PROPERTY

The growing importance of IP in food production and farming has a direct influence on future food security.[26] IP law has comprehensive and far-reaching implications on the future control

[23] Borlaug (1970).

[24] Food Product Law and Legal definition http://www.definitions.uslegal.com (accessed 30 Aug 2017).

[25] Legal Content http://www.eur-lex.europa.eu (accessed 31 Aug 2017).

[26] Tansey & Rajotte (2009) 23.

of food supply.[27] In theory, the objective of IPRs such as patents is to advance human welfare and development by stimulating invention. The application of the current system relating to patents and plant breeders' rights (PBRs) in agriculture and food supply has proven to be inadequate in addressing food security. It is vital to consider food as part of agriculture in a holistic framework.

In the early 1990s new international rules on IP were introduced to expand and outline the future control of food production and supply.[28] Little progress was made with regard to GRs and associated TK of African countries which are currently freely accessed, despite being worth billions of dollars in the competitive global market.[29] Eighty percent of global GRs contributing towards genetic engineering come from developing countries.[30] The development of biotechnology through genetic engineering intensifies the application of IP in agriculture.[31]

International forums discussing food insecurity usually focus on natural phenomena, war and politics. The contributions of IP law to food security have been ignored. The existing IP law regarding food and agriculture focuses only on the value chain of biotechnology and PBRs. The conservation, TK and importance of food for man's survival are constantly ignored. IP law promotes the control of food conferred by IP law and thus aggravates food insecurity.

[27] *Ibid.*

[28] Tansey & Rajotte (2009) 23.

[29] E Kamau & G Winter *Genetic resources, traditional knowledge and the law* (2009) 5.

[30] *Ibid.*

[31] M Blakeney *Intellectual property rights and food security* (2009) 5.

Member states of WIPO are still struggling to reach agreement on the scope of patent applications on biological resources. As a result, in 2000 the General Assembly of WIPO at its 26th session established an intergovernmental committee (IGC) for the first time to oversee matters concerning IP and GRs, TK and folklore.[32] Over the course of the past decade negotiations to create the international legal instrument, which will ensure the effective protection of agricultural resources and associated TK, have been held in the quest to include developing countries.

In theory, the objective of IP rights is to advance human welfare and development; in contrast the application of the current regime, particularly in food production and supply, often undermines the fundamental human right to food.[33] The interaction between IP law and food is usually influenced by international norms, conventions and treaties and will broadly be discussed at a later stage.

The minimum requirement for IP protection in agriculture was the first time introduced by the WTO.[34] The implementation of the provision for an agreement on Trade Related-aspects of Intellectual Property (TRIPS) remains a challenge for developing countries due to its ambiguity and as the administration costs which come with it are unattainable for most developing countries.[35] For this reason and others change in the system is required to resolve the issue and bring global legal certainty, especially in agriculture and food.

[32] *GRTKF* (2001). http://www.wipo.int (accessed 9 Feb 2016).

[33] http://www.wipo.int (2001).

[34] M Rimmer *Intellectual property and biotechnology: Biological inventions* (2007) 50.

[35] CM Correa *Intellectual property rights, the WTO and developing countries: The TRIPS agreement and policy option* (2002) 121.

The International Covenant on Economic, Social and Cultural Rights (ICESCR) stated its concern regarding IP protection. According to the United Nations (UN) committee on ICESCR, IP protection was supposed to be a social product to serve people, but started focusing on economic goals only.[36] The committee also recommended that IP law must respect and conform to human rights law.[37]

Furthermore, the Convention on Biological Diversity (CBD) aims to safeguard life on this planet and has been involved in planning to expand IP.[38] The CBD was negotiated under the umbrella of the UN Environmental Program.[39] This in itself is problematic. The environmental ministers who negotiated the Convention know about rainfall and not about agriculture. It is not clear if the issues to safeguard agriculture and its safe practice are well addressed in the negotiations by the environmental ministers rather than agricultural ministers.

The CBD, contrary to TRIPS, hands over sovereign rights of the GRs to the host state.[40] In terms of the Universal Declaration of Human Rights (UDHR) states have an obligation to its citizens to ensure food availability and accessibility at all times.[41] If the state loses its ability to

[36] Economic and social council, committee on economic, social and cultural rights (2002) http://www.refworld.org (accessed 7 Mar 2015).

[37] *Ibid.*

[38] TM Bubela & G Richard *Genetic resources and traditional knowledge: Case studies and conflicting interest* (2012) 9.

[39] Kamau & Winter *Genetic resources, traditional knowledge and the law* (2009) 52.

[40] *Ibid.*

[41] *Declaration of Human Rights (*1948) http://www.un.org (accessed 3 Feb 2016).

provide food security, power automatically falls into the hands of those who own the food, which may threaten the security of the state and ignite unrest.

The international food system should assist local governments to fulfil their obligations in terms of the UDHR and give incentives to the state to be able to provide available and accessible food to the people.

There are no clear indications with regard to the interaction between IP rule, the establishment and conservation and sustainable agricultural development.[42] The developing countries have struggled to balance their international obligations and at the same time fulfil their national responsibilities, such as social development, food security and access to medication,[43] under the expansion of IP rules. What is more, TRIPS provides minimum international IP standards in agriculture.[44] It was created under the jurisdiction of WTO in an attempt to establish new rules and disciplines and is moving IP into the realm of international trade law.[45]

In contrast with the CBD, TRIPS confers ownership of GRs, (plant and genetic material) to private individuals.[46] The occurrence of conflicting international provisions makes it more difficult for states to comply and respect the right to food at the same time. The international provisions governing food and agriculture should complement one another. However, IP on the one hand confers private ownership on plant and GRs; the CBD on the other hand gives

[42] C Chiarolla *Intellectual Property, agriculture and global food security: The privatization of crop diversity* (2011) 24.

[43] S Ragavan *Patent and trade disparities in developing countries* (2012) 168.

[44] Chiarolla (2011) 76.

[45] Tansey & Rajotte (2009) 48.

[46] *Ibid*.

sovereign rights to the states. This presents an actual problem where population growth is rapid; the food produced is unevenly distributed. This results in food insecurity becoming critical in some parts of the world.

The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) in contrast allows free access to other plant and GRs for research, breeding, conservation and training purposes.[47]

The International Union for the Protection of New Varieties of Plants (UPOV) focuses on IP in the commercial sector enabling PBRs and providing international protection.[48] The Convention was established by 12 European countries in 1961 to promote commercialised agriculture. Although there is a difference between IP provisions and UPOV they share essential characteristics, both providing exclusive commercial exploitation rights to private persons and corporations.[49] This right is similar to patent, UPOV granting breeders exclusive rights to plant varieties deemed discovered.[50] UPOV expresses its opposition to mandatory disclosure of the origins of plant and GRs as a condition in the CBD.[51]

The mixed and complex existing global rules that govern food and agriculture deepen the present international food crisis. The existing legal instruments on food production and supply have fallen short to promote and protect the right to food and create a balance between the protection of IP rights and the right to food.

[47] Tansey & Rajotte (2009) 65.

[48] *UPOV Report on the impact of plant protection* (2005) 11 http//www.upov.int (accessed 3 Feb 2016).

[49] *Ibid.*

[50] Tansey & Rajotte (2009) 32.

[51] *Ibid* 150.

It is argued that food should not be left only in private hands, without workable rules and regulations to balance that with private property rights and common rights within the public domain. The existing systems governing food and agriculture are lacking in many respects. Corporations are taking advantage of the weakness and constraint in the system and aggravate the situation even further. The multinational companies are more concerned with profit with limited reflection on social responsibility. In practice increasing global food production does not guarantee accessibility to those who need food.

The international food systems as they stand now focus only on high production without taking into consideration the accessibility of the food produced harmoniously. This practice only deepens the existing global food crisis. This study does not necessarily advocate free access to food. It rather advocates the pursuit for distributive justice in the allocation of the right to food and the right to IPR.

1.5 FOOD INSECURITY IN THE CASE OF SOUTHERN AFRICA

In order to facilitate a focused examination of the subject, Southern African communities serve as a classic case study. These communities serve as an example of how the application of international food systems, including IP on food and agriculture, has contributed to their food insecurity. Food security will be historically examined to ascertain whether the absence of IP law in the food and agriculture realm has increased food insecurity. It is clear from the outset that there is a need to rethink the international food systems.

It is important to understand the process behind the existing global food calamities in certain parts of the world, to unveil the tensions created in the global food production and supply with the objective of establishing how food can be made available and accessible to all. The case study below illustrates how the existing international food systems intensify the already existing food insecurity and poverty.

The San communities (San) have been selected as a classic case study for this thesis for analysis as well as specific topics of significance in relation to food security and food law. The San have immense ecological knowledge of their surroundings and often produce their food through traditional practices.[52] These traditional practices have to some extent been lost due to displacement, war, deforestation, competition for limited resources and the change from traditional to modern food.[53]

Currently, the San communities mostly live in the dry zones of Botswana, Namibia, South Africa, Angola, Zambia and Zimbabwe.[54] Today the San numbers are roughly estimated at 100 000 people spread out across this region.[55] These communities have been living in this region for more than 2000 years.[56]

Over the years, these communities were severely affected by global trends and have been unable to uphold their traditional ways. These communities were self-reliant, producing their

[52] *The plight of the San* http://www.irinnews.org (accessed 5 Mar 2015).

[53] *Ibid*.

[54] *Working group of indigenous minority* http://www.wim.sa.org (accessed 4 Feb 2015).

[55] *Ibid.*

[56] *Ibid.*

own food before they were dislodged by Bantu and white settlers across the region.[57] In addition, just as the rest of the world, their food security was also affected by global trends and norms governing food and agriculture. As a result, the people belonging to these communities were unable to continue producing their own food and became labourers or are unemployed. Food is barely accessible to them.[58]

It is argued that the San communities' food insecurity was caused firstly by their inability to produce their own food locally due to the loss of their traditional land where they gathered and hunted their own food, with no alternative means of sustenance. Secondly, they are deprived of the benefit of their plant, GRs and associated TK. Thirdly, under the current IP law there is no protection and recognition of the traditional plant, GRs and associated traditional inventions of these communities and they have failed to derive any kind of financial gains from this 'loss'. As a result, these communities fell into poverty.

The food available in the market is not affordable for these communities; it is fair to say that the current IP law aggravates the restriction on access to food; IP gives exclusive commercial exploitation rights to certain groups of private persons or corporations.[59] The holder of the right will determine at his own discretion, who gets to eat food or not, depending on his/her financial ability.

[57] http://www.irinnews.org.

[58] *Ibid.*

[59] KR Gray *Right to food principles vis à vis rules governing international trade* (2003) 4. See http://www.cid.harvard.edu/citrade (accessed 6 May 2016).

The struggle of the San should not be forgotten. Today these communities are invisible. The global economic expansion has barely left these communities untouched. They are identified as the poorest across the region and most rely on welfare services (if available) or work as casual labourers.[60]

The San communities have been selected to illustrate how the existing IP law and international food systems affect their ability to access food and have crippled their traditional economy. The governments of the region do not provide adequate recognition to their suffering nor do they provide alternative economic incentives to enable them to participate in the growing global economy to eradicate poverty and food insecurity.[61] Furthermore, the food insecurity of the San is aggravated by multinational corporations taking ownership of indigenous knowledge, products such as grains, plants and associated TK through patents and PBRs.[62] This has led to limited access to seeds for indigenous farmers. The San communities traditionally were hunters and gatherers as a mode of food production before such system of production were interrupted and transited to herding and cultivation. Plant, GRs and associated TK of the indigenous people should be exploited to their benefit to ease their poverty and stabilise the traditional economy.

The debate in international forums on the current IP law in agriculture is more complex and taking longer than anticipated and has been continuing for the last decade. Reform of the WIPO was initiated by developing countries in order to review the existing IP law to promote

[60] Gray (2003) 4.

[61] *Ibid.*

[62] Tansey & Rajotte (2009) 23.

food security. This has been ongoing since 2000.[63] The protracted debate has subsequently eroded the trust and confidence of developing countries in IP law at the WTO.[64] For the developing countries IP law involves dictated rules to compromise their interests and needs for the sake of foreign direct investment. They are seen to be aimed at avoiding economic sanctions for the violation of existing international law and do not appear to be fair. In all fairness they should have participated in the drafting of the provisions to address their priorities.

Finally, the modern challenge of increasing food insecurity will firstly have to deal with the growing mixed and complex international rules. Secondly, the new economic reality of the dominant role of the private sector will have to be dealt with. The private sector seeks to commercialise their agricultural inventions but misses a key point to balance property rights, common rights and the public domain and as a result has failed in its social responsibility. In addition, IP law creates a gap by failing to give equal protection to traditional inventions and resources. The approach proposed in this paper attempts to provide an alternative structure in the existing international food law which is more equitable and comprehensive and in line with a quest for justice for all.

[63] http://www.wipo.int (2001).

[64] H Khoury *A neo conventional trade mark regime for "newcomer" states* art 1348 (2010) 356. See http://www.scholarship.law.upenn.edu (accessed 24 Nov 2016). See also D Gervais *The TRIPS agreement Drafting history and analysis* (2nd ed Thompson Sweet and Maxwell (2003) describing the drafting process for the TRIPS agreements.

1.6 THE SIGNIFICANCE OF THE STUDY

The significance of this study lies in its aim which is to extend the reach of the analysis beyond the current collective understanding of research of the international food systems including the IP law governing food and agriculture in addressing food security. It uses this understanding of the international food systems and its governance to examine a holistic and equitable approach to food security.

The emerging understanding of the existing international food law will be utilised in order to find the most appropriate solutions for the current issues surrounding the global food crisis.

1.7 THE SCOPE AND LIMITATION OF THE STUDY

This thesis consists of a comprehensive critical analysis of the current international food systems and their historic position. Thereafter, a critical legal analysis of international food law and its effect on food security follows. The thesis aims to create a reasonable understanding of the impact of IP protection on food security and uses a legal theory as instrument for analysis.

This thesis is limited to the analysis of existing international food systems and patent law on food and to general underlying principles, emerging trends and the characteristics of the current international food law, including patent law. The effect of current IP law on food control in Southern Africa will also be examined.

This study does not include beverage, plant and animal products, but specifically focuses on plant foods of plant origin which are edible by humans only, excluding microbes.

1.8 METHODOLOGY OF THE STUDY

The research will be conducted using a qualitative approach of a multi-disciplinary nature and will include aspects of agriculture, economics and law.[65] Both a desk and data based approach, utilising qualitative tools, will be used in conducting the research.

By bridging three main disciplines, the agricultural, economic and law disciplines, the study will provide the appropriate practical legal framework for a hypothetical model. Viewing issues simultaneously through the perspective of more than one discipline provides a wide and secure platform from which to approach the study.

A descriptive analytical approach will also be used to analyse the international food law specifically, Trade-related Aspects of Intellectual Property Rights, Food and Agriculture Organisation Treaty, Convention on Biological Diversity, the International Treaty on Plant Genetic Resources for Food and Agriculture and the International Union for the Protection of New Varieties of Plants and their objectives. The existing international food law and IP law will be reviewed and the future control of food will be considered, constructing a conceptual framework to sustain this study.

[65] The research will transcend the boundaries of different disciplines.

1.9 RESEARCH QUESTIONS

This research will respond to the following questions:

Is the current IP law capable of facilitating and supporting the goal of ending hunger and increasing food security?

Will the current international food law promote fair and equitable food production and supply practices to benefit all who need it?

Will the existing global food law, including IP, create incentives for farming practices that are ecologically sound as well as culturally and socially appropriate?

1.10 STRUCTURE AND ARGUMENT

To respond adequately to the above questions this research is structured as follows:

Chapter 2 contains a detailed analysis of the interface between IP, GRs and associated TK. The discussion in this chapter will include the battle between IP protection and the right to food. The patentability of GRs and protection of TK are key concepts of this study and will be discussed in detail. Furthermore, bio-piracy and the misappropriation of GRs and breeders' rights will be discussed.

Chapter 3 contains arguments on the ongoing discussions on food security in international forums and rights to food; which are key areas. The background of the adoption of the Food

and Agriculture Organisation (FAO) international treaties on food and plant variety protection under the Paris Convention will also be discussed in this chapter.

Chapter 4 will consider a detailed discussion on the interaction between patent and agricultural inventions, the economic value of patent and food security. Furthermore, the TRIPS of the WTO and agriculture, WIPO and agriculture and the effect of patents on agricultural trade negotiations will be discussed.

Chapter 5 will provide the discussion on global agreements and negotiations at various international forums such as the agreement on CBD, UPOV, ITPGRFA and the ongoing discussion at the WTO, on the review of Article 27(3)(b) of the TRIPS. The potential weaknesses of these treaties, conventions and their negotiations in the adoption process, the extent and the scope of food security are identified and addressed.

Chapter 6 will investigate the progress made in the implementation of the international food systems nationally and its effect and benefits. It will further study the implementation thereof together with the enforcement of FAO, CBD, ITPGRFA, UPOV and TRIPS principles.

Chapter 7 contains the conclusion which will be drawn from the above analyses by giving the finding on the investigation and evaluation of the international systems, particularly in respect of its influence on food security. It will explore the principal failing of the system addressing food security.

These conclusions will derive its information from detailed reviews of international food law and IP law discussed throughout this thesis. It will thus focus on changes needed in

international food law to address food security as a focal point and will recommend a modest proposal as to how international systems governing food and agriculture should address food security sufficiently, based on the findings.

Although, it is arguable that the political will of leaders for change in the systems plays a vital role, it is important to bring certainty and predictability into the international food systems promoting food security. This will enable countries to respond to the long standing global food insecurity, poverty alleviation and stabilise the traditional economies. This study will propose the way forward based on a comprehensive multi-sectorial and multi-disciplinary approach to harmonise IP and international food systems to complement and cooperate with one another.

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CHAPTER 2

CHAPTER 2

The Interface between Intellectual Property, Genetic Resources, Associated Traditional Knowledge and Existing International Food Law

2.1 INTRODUCTION

This section provides a very broad overview of the interface between IP, GR and associated TK and highlights the connection between IP law and food security. It also contains a detailed analysis of international law governing food and agriculture. The discussion in this chapter will include the rigidity between IP law and the right to food, the patentability of GRs and the protection of TK. Bio-piracy and misappropriation of GRs as well as breeders' rights are among the key points to be discussed.

The application of IP law on food and agriculture is often influenced by international norms and treaties. It is clear from the outset that the existing international norms and treaties governing food and agriculture often complement IP law. For example, the CBD has been in construction to expand IP protection[66] in the same way as the UPOV which focuses on IP in the commercial sectors to protect PBRs internationally.[67] The TRIPS agreements provide minimum global IP standards in agriculture and allow broad patent.[68] On the contrary, the ITPGRFA allows free access to plant and GRs for research, breeding, conservation and training purposes.[69]

A treaty regulating international patent law was signed the first time in Paris in 1883 with the objective to apply it to industrial property in the broadest sense.[70] The criteria of patent law have not been changed much since its adoption, although there have been multiple reviews of the Convention.

The most important current issue is whether the current patent standards recognise the fact that the biological inventions eligible to patent are dependent on access to the existing GRs and associated TK. According to WIPO a study has been done on the established patent law

[66] Tansey & Rajotte (2009) 82.

[67] M Lightbourne *Food security, biological diversity and intellectual property rights – intellectual property theory, culture* (2009) 43.

[68] Tansey & Rajotte (2009) 51.

[69] Chiarolla (2011) 22. Art 9 of the ITPGRFA provides that the responsibility for realising farmers' rights rests with national governments, to protect associated TK with GRs and agriculture, equitable benefit sharing from the utilisation of the agricultural resources and making decisions on matters related to the conservation and sustainable use of GRs. This system confers the right of the farmers to preserve, share and promote their traditional practices, knowledge and innovations that help in conserving and developing crop diversity.

[70] *Summary of the Paris Convention for the Protection of Industrial Property of 1883* http://www.wipo.int (accessed 10 Feb 2017).

requirements of disclosure with regard to GRs and TK.[71] However, there is no one single disclosure situation that could capture all the existing concerns about GRs and TK relevant to patented inventions.

The analysis of the IGC technical group of WIPO suggested that, in a case of concern where prior informed consent was not obtained where GRs and TK were accessed to bring the invention, an enquiry such as the following has to be made:[72]

1. Disclosure of the actual source of GRs and/or TK
2. The GRs and/or TK used are required to be fully described
3. Disclosure of the provider of the TK and/or GRs
4. New and non-obviousness of the invention.[73]

It is argued that such enquiry may result in identifying whether there is an existing legal relationship between the inventor and the access to GRs and TK, rather than the link between the inventions as such and GRs and TK.[74]

These analyses and suggestions by the IGC of WIPO on IP, TK, GRs and folklore have not been realised into law. The analysis thereof is part of a contribution to the ongoing discussion and a mere technical input to facilitate further policy discussion which this paper agrees with.

[71] *Technical study on the disclosure requirements on patent system related to genetic resources and traditional knowledge* (2004) http://www.wipo.int (accessed 10 Feb 2017).

[72] http://www.wipo.int (2004).

[73] http://www.wipo.int (2004).

[74] *Ibid.*

This increasing complexity of the various international treaties governing agriculture creates a disparity. Although IP cannot entirely be blamed for the existing food crisis, it to some extent aggravates the existing global food crisis.

Farming is central to ensuring food security; there is uncertainty about the sustainability of the manner in which IP protection currently is granted on agricultural resources.[75] There is an increase in broad patent on seed rights resulting in farmers being subject to these restrictions. Consumers then suffer an increase in the price of food.[76] The market concentration and statutory domination rights conferred by IP law on food are sometimes considered to be unethical, while there is extensive hunger globally.[77] Powerful nations will create new forums to protect their interests if a current forum does not afford them IP protection. This enables them to gain market dominance.[78]

IP protection mostly has been disproportionately influenced by the interests of industrialised nations and corporate actors. The participation of the developing countries in the formulation of the global norms is almost non-existent, other than them becoming mere parties to the treaty. It is doing no more than dictating to them to exchange their interests and needs for mere membership and for possible uncertain future foreign direct investment. It is questionable if the competitiveness of developing countries under the existing globalised IP standard of

[75] Tansey & Rajotte (2009) 23.

[76] Tansey & Rajotte (2009) 141.

[77] *Ibid* 115.

[78] *Ibid*.

validation of products is eligible to provide adequate protection. Therefore, such unequal distribution of rights and protection are quite static.[79]

It is highly important to re-examine the formulation of international IP law in respect of its inclusivity and legitimacy across a range of other issues. It is also equally important to harmonise IP with other international systems, especially governing food and agriculture in addressing food security. It is argued that IP law should have a provision to recognise the fact that new inventions often depend on access to the existing GRs and TK and it is important to determine the legal relationship between the inventor and the access to GRs and TK. This possibly will help to curb the misappropriation of GRs and associated TK.

IP law solely focuses on the inventor interest, but largely ignores public interest and gives absolute power to the patent holder. Current IP law demonstrates an understanding of the connection between the risk and reward of the innovator, but lacks an appropriate level of understanding of societies' loss of TK and GRs the law is supposed to protect and promote.

In a reported case in the USA *AG Supply V Pioneer Hi-Bred International, Inc.,* the Supreme Court held that a large seed company (Pioneer) was suing a smaller seed company for violating patent rights on hybrid corn seed.[80] The restriction of access to seed imposed by IP law is often harmful, especially to vulnerable communities and aggravates food insecurity. This raises the

[79] S Biber-Klemm & T Cottier *Right to plant genetic resources and traditional knowledge: Basic issues and perspectives* (2008) 203.

[80] KC Rose 'Protecting the Farmers: limiting Liability for Innocent Infringement of Plant Patents' (2011) 123 *Wake Forest Journal of Business and Intellectual Property Law* vol 12 no 1. See *JEM AG Supply V Pioneer Hi-Bred Int'l Inc.,* 534 US 128 (2001). See also http://www.iplournal.law.wfu.edu (accessed 11 May 2016).

question of how far IP law is promoting and safeguarding biodiversity and associated TK, the very basic thing needed for the conservation and protection of the ecosystem. The absence of one and the same protection for traditional resources and invention may lead to misappropriation.

The imbalance of protection between TK and resources and emerging science and technology expose the fragility of the IP system impeding one over the other. It is interesting to see the competing interest through the lens of IP law protecting the commercial industry exclusively and there being no international definition or guidelines on indigenous knowledge to be protected, creating a legal imbalance.

It is necessary to consider international IP law, including the treaties mentioned above, in order to highlight the very different conditions of the developing countries' local legislation addressing equal protection and promotion of indigenous resources and knowledge compared to international law, which is a central pillar of the arguments made hereunder.

2.2 INTELLECTUAL PROPERTY AND TRADTIONAL KNOWLEDGE

TK cannot be separated from GRs.[81] In terms of IP law GRs on their own are considered a natural phenomenon and not eligible for protection under the law, although new varieties created using GRs and associated TK are eligible for protection through the IP system, but this is not without a challenge. The ongoing question about access to law and legal advice to indigenous people remains a central issue. The indigenous peoples' ecological knowledge

[81] *Protecting community rights over traditional knowledge (2005.* http//www.wipo.int (accessed 12 Apr 2015).

existed long before science and technology.[82] They understood their surroundings through traditional practices, acquired knowledge through experience and their relationship with animals, plants and land is established through spirituality.[83]

Scientific knowledge is gained from observation and experiments taking place within a short period of time.[84] TK may be described as the best of what science can offer in agriculture, considering the traditional peoples' experience on their land and knowledge of ecology. It is argued that TK found among indigenous people results from the spontaneous exchange of ideas, observation and experiments among themselves. TK is a crucial part of the continuation and survival of indigenous communities from medicine to food. The erosion of it leads the community deep into poverty and jeopardises their existence.

Under the existing IP law the advanced technological knowledge is eligible for protection, but the TK is mostly regarded as a public domain.[85] The imbalanced distribution of justice for advanced technological knowledge and TK is one of the main problems in the current IP formulation and it is possible the legal and political landscapes between developing and developed countries may turn hostile when the review of rules is sought. This is a challenge and not likely to take place in the near future.

The extent of current proposals of African groups at the WTO and WIPO on the protection of TK reflects the complexity of the issues. It is clear that the proposal by African groups is that

[82] Tansey & Rajotte (2009) 78.

[83] *Ibid.*

[84] *Ibid.*

[85] Tansey & Rajotte (2009) 78.

the law should support the rights of member states to protect important public policy goals such as food security, eradicating poverty and providing access to medicine.

At WIPO the African groups are still in the process of negotiation on the eligibility of indigenous knowledge for protection under IP law. This has been debated for more than a decade and the finalisation is still pending. Some African countries locally have now taken the initiative and have adopted a new law or and repeal for the existing IP law to give protection for indigenous inventions and resources locally.

To this effect South Africa out of a genuine concern for the misappropriation of TK and GRs is making headway and continues changing its law. In 2005 it amended its Patent Act 57 of 1978,[86] to add certain definitions and requirements for an applicant for a patent to comply with the objectives to create a guide for the recognition and understanding of Africa's wealth of indigenous knowledge and resources.[87] The Patent Amendment Act No 20 of 2005[88] further prescribed a disclosure requirement relating to TK and GRs if any might be used that have led to the invention.[89] Section 4(1) of the Bill prescribed that where TK or GRs were utilised, the indigenous communities had to be compensated or benefits shared or co-ownership provided before approval was granted to avoid the misappropriation of indigenous resources and knowledge.

[86] South *African Patent Amendment Act 2005* (Act No 20 of 2005) http://www.wipo.int (accessed 7 Feb 2016).

[87] *Ibid.*

[88] *Ibid.*

[89] *Ibid*.

Furthermore, in 2008 the Department of Trade and Industry instituted a policy framework for the protection of TK through the IP system and Intellectual Property Law Amendment Bill, 2008.[90] This proposed Bill was not passed into legislation.

In 2013 South Africa adopted another new Act for the protection, promotion, development and management of indigenous knowledge.[91] Although the Act has a similar position as the developing countries at WIPO, the right to be protected specified in the Act is too limited considering TK is a fixed form that might regress and take a different form.[92] Section 11 of the Act provides that TK is a fixed form that can be historically identified and linked to a particular community, rather than understanding how TK can evolve over time and take on many different natures.[93]

In 2015 South Africa introduced the *sui generis* approach to the legislative protection and commercialisation of TK systems.[94] The Act seeks the protection, promotion, development and management of TK systems.

To be specific, the Act amended four kinds of IP Acts namely, the Performer Protection Act, Copyright Act, Designs Act and Trademarks Act. The amendment Act further provides recognition and protection of and creates new forms of IP for indigenous people explicitly,

[90] *Policy framework for protection of indigenous knowledge through the IP system and the IP Laws Amendment Bill* (2008) http//www.gov.za (accessed 7 Feb 2016).

[91] *Act No 28 of 2013: IP Laws Amendment Act of 2013* http://www.thedti.gov.za (accessed 1 Feb 2016).

[92] 'Protecting traditional knowledge' *De Rebus* (2014) 110 http://www.saflii.org (accessed 7 Feb 2016).

[93] http://www.saflii.org.

[94] L Daniels *A cautious welcome for South Africa's TK legislation* (2015). See http://www.ip-watch.org (accessed 7 Feb 2016).

indigenous IP for indigenous performers, indigenous copyright works and indigenous trademarks.

The concern for the misappropriation of plants, GRs and associated TK is shared among other African countries as well and some seek alternative local legislative protection and have therefore followed in South Africa's footsteps. For example, in Zambia a similar new Act came into effect, namely the Protection of Traditional Knowledge, Genetic Resources and Expressions of Folklore Act, No 16 of 2016.[95] It provides a legal framework for the protection of access to and use of TK, GRs and expressions of folklore, which guarantees the equitable sharing of benefits arising from the utilisation of that resource and the effective participation of holders.[96]

The problem of international IP law concerning TK is not procedural, but theoretical; it is about the legal meaning given to the TK and emerging inventions. The TK is mostly considered as a public domain whereas, emerging inventions are protected and promoted by law as a person's property. Therefore, the developing countries still can't see the legitimacy of the international IP law on their terms and this creates legal uncertainty. As a result, countries need additional assistance to adapt instruments to local circumstances and needs.

It is rational to say that lack of support and legal protection to indigenous traditional practices and resources cause losses during modern invention. It is no longer considered as controversial to assert that the absence of protection and investment displaced traditional economies from

[95] *Zambia: Industrial and traditional knowledge* (2016) http://www.wipo.int (accessed 7 Feb 2017).

[96] *Ibid.*

the global market. Even though the TK has continued to develop in a different space compared to emerging invention, considering the non-existence of investment persistence, this practice could not enhance the traditional economy. The loss of talent and invention in these communities occurs due to economic reasons and the lack of legal protection.

The indigenous communities face challenges to develop new and generate profit from the existing useful plants, GRs and associated knowledge.[97] Indigenous people and communities are experiencing problems with multiple aspects of knowledge control and governance. In the absence of legal protection, it remains protected by a traditional way of life, values and norms; but was unable to stop the misappropriation of their resources and associated TK, mostly by third parties,[98] for commercial exploitation. It is unfortunate that knowledge associated with plants and GRs transferred from generation to generation by word of mouth is particularly easy to be misappropriated by a third party.

Out of this concern the CBD created a mechanism to ensure fair benefits and recognition to GRs and associated TK used to create an invention. The provision prescribed that benefits are to be shared with the holders of the knowledge, which in most instances are the indigenous people or the local communities where the TK is practised.[99] The implementation of the provision of the Convention has been problematic; as a result the Ad Hoc Open-ended Inter-

[97] *Bio piracy and seeds* http://www.alt.no-patent-on-seed.org (accessed 10 May 2016).

[98] *Ibid.*

[99] Blakeney (2009) 134. The Preamble to the CBD recognised the traditional dependence of many indigenous and local communities embodying traditional lifestyles on biological resources, and the desirability of sharing equitably arising from the use of TK, innovations and practices relevant to the conservation of biological diversity and sustainable use of its components.

Sessional Working Groups (AHTEG) identified five elements to be considered for inclusion, particularly in Article 8(j) of the Convention these are:[100]

1. Measures to ensure obedience with prior informed consent of indigenous and local communities holding TK with GRs, in accordance with Article 8(j) of the CBD.
2. Disclosure of the origin of GRs and associated TK.
3. Recognition and protection of the rights of indigenous and local communities of their GRs and associated TK.
4. Recognition of customary law and traditional cultural practice of indigenous people and local communities.
5. Code of ethics.[101]

At the ninth meeting of the AHTEG on this issue in 2010, a draft of the protocol was tabled for further negotiations. Nonetheless, the working group was unable to reach agreement and suspended the meeting subject to future further negotiations.[102]

[100] *Ibid* 134-135 art 8(j) of the CBD subjects the signatory states to implement in its national legislation, respect, preserve and maintain knowledge, innovation and practices of indigenous and local communities embodying traditional practices relevant for the conservation and sustainable use of biological diversity and promote their wider application with approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefit arising from the utilisation of such knowledge, innovations and practices.

[101] Blakeney (2009) 134.

[102] JC Medaglia *Sustainable development law and policy* (2010) vol 10 iss 3. *Sustainable pathways toward biodiversity preservation* art 9 (2010) 25. See http://digitalcommons.wcl.american.edu/ (accessed 12 May 2016).

The following example of the experience of indigenous communities will illustrate how the indigenous communities' traditional resources and associated inventions are used by third parties to their disadvantage.

The San communities, specifically of Botswana, Namibia and South Africa, have used a plant 'Devil's Claw' for traditional medicinal purposes for centuries.[103] Since 1962 dried tubers of 'Devil's Claw' were exported to European counties to produce herbal medicines, similar to the traditional one used by these groups without disclosure,[104] and they have thus been deprived of their deserved quantifiable benefits.

Most African countries do not recognise the value of their TK until it is exported and becomes a protected commodity to be sold back to them.[105] Until then, indigenous people do not realise that their knowledge and resources have economic value and they end up buying those resources in masquerade form, which previously belonged to them. As a result, the new generation of those specific communities are disempowered from furthering traditional inventions using their cultural, environmental and territorial resources. Many resources are lost in the process.[106] Locally varied food production systems as well as traditional skill and culture are under threat. Since the 1900s 75% of edible plant species and GRs have been lost as traditional farmers left farming.[107]

[103] http://www.wim.sa.org.

[104] http://www.rufford.org (accessed 4 Mar 2015). 'The indigenous San of Southern Africa have used Devil's Claw (Harpagophytum Procumbens) tubers for medicinal purposes for centuries. The Devil's Claw plant is a perennial herb, sprouting annually from a tuberous primary tuber from which the secondary tubers are formed.'

[105] *Ibid.*

[106] *What is happening to agro biodiversity?* http://www.fao.org (accessed 17 May 2016).

[107] *Ibid.*

It is a tragedy that these communities increasingly surrender themselves to patented inventions available in the market, which most of the time they cannot afford to buy. These practices cripple the indigenous communities and prevent them from playing their part in the growing global economy and to eradicate poverty. A law that neglects or deepens inequality among nations can exacerbate the combination of poverty and food insecurity. This in turn weakens social interconnection and indigenous people under the existing IP law and disenfranchises them from participating in the current global economy.

The ongoing debate related to TK and GRs at WTO, WIPO and CBD is supposed to be a good opportunity for the leaders of these communities to bring the issue to the attention of world leaders. The lack of community representation in the world forum unfortunately has harmful consequences for these communities who are left behind.[108] The exclusion practices in many respects and the imbalanced representation in the global forums create confusion and unrest and leaders are unable to find lasting solutions. In most international forums the representatives of indigenous people are ill-informed and have no clear knowledge of the communities.[109] As a result these issues have never been addressed sufficiently. It is not understood by millions why indigenous people address their own affairs without the guardianship of their colonial masters.

[108] *Ibid.*

[109] *Participation and prior informed participation of indigenous people in the implication of CBD: Report on the report on the III international indigenous forum on biodiversity* (2005). http://www.trade.ec.europa.eu (accessed 21 Feb 2016).

The United Nations Declaration on Rights of Indigenous Peoples of 2007 recognises the right to maintain and protect TK among other rights,[110] although globally there is no respect for TK or GRs of indigenous people. There is a need to redress the rights of indigenous communities, to be given the protection and recognition they deserve and to create a mechanism to encourage the communities to contribute to humanity and participate in the global growing economy.

2.3 PATENTABILITY OF GENETIC RESOURCES

In terms of the general guideline of WIPO, to be eligible for patent, inventions must satisfy the following criteria:[111]

1. It must consist of a patentable subject
2. It must be industrially applicable (useful)
3. It must be new (novel)
4. It must exhibit a sufficient inventive step (non-obvious)
5. It must disclose material used to the development of the invention.[112]

The introduction of IP in agriculture intensified after the development of biotechnology.[113] It is important to suggest that sustained and long-term farming efforts are only worthwhile if there is a chance to be rewarded. Historically, traditional farmers conserve and protect agriculture informally and thus should not be deprived of the fair opportunity to benefit from their hard

[110] *Ibid.*

[111] *Field of Intellectual property protection* http://www.wipo.int (accessed 10 Feb 2017).

[112] *Ibid.*

[113] A Kur & V Mizaras *The structure of intellectual property law: Can one size fit all?* (2011) 188.

work under the current law. The international IP extended patent protection for the modification of GRs as inventions rather than discoveries.[114] Often the special quality of biotechnology occurs from naturally occurring events or TK, a combination of genes as some argue.[115] Patent law criteria of biotechnology, in particular the non-obvious, have been quite litigated suggesting that they would have been obvious at the time the invention was made.[116] Unfortunately, in the background of biotechnology, patent law has failed to maintain a proper balance between property right and public domain.[117] Therefore, the patent law will have to adapt to address technological change to avoid further legal uncertainty in the agricultural industry.

Patenting seed is problematic due to its distinct nature, unlike other non-living inventions or processes. Seed by virtue of its nature may travel by wind, birds and animals. Pollen of seed can also easily travel from one area to another. In such cases, patent holders might raise patents as a strategy to exclude others from using the seed discovered in this manner.[118] Current patent law has no explicit provision for such incidents.

There is an inherent conflict between IP rights and food when the position of who created, produced and used it, is identified. The role of IP law on food production is in most instances arguable. There are practical problems when applying patent law on plant varieties.[119] Patent law was not developed for biological products capable of reproducing themselves, unlike other

[114] M Cooper *Life as surplus, biotechnology and capitalism in the neoliberal era* (2008) 16.

[115] http://www.alt.no-patents-on-seeds.org.

[116] A Rai *Intellectual Property and Biotechnology: Critical concept in intellectual property law* (2011) 827-831.

[117] *Ibid.*

[118] Rose (2011) 118-119.

[119] M Rimmer (2008) 50.

products.[120] The two main reasons that plant material does not meet the requirement of patent law are, firstly, novelty, inventive steps and disclosure. Secondly, patenting plants was not thought to be of public interest and to give such broad monopoly given their necessity to society.[121]

The typical conflict between the existing IP law and food security and IP law's global extension has largely been brought about as a conservative, protectionist response to fundamental technical change by a set of industries whose business models may not be effective in the current new world setup and new demand, and therefore needs reform.

The question raised here is why patent applications on food are silent on public goods or global commons, or equitable protection, where countries' priorities differ. It seems as though no meaningful solution has been brought forward to resolve the outstanding global food crisis. The debate between developing and developed countries on food security seems drawn back from the actual solution to find common ground. The developing countries want to protect and promote the TK and resources the same way developed countries want to protect their bioengineering industries. This creates unfair competition and a battlefield of two sides of knowledge and resources to respond to the dire issue of food insecurity.

Critics argued that food produced through bioengineering, but not necessarily increasing yield, far exceeds conventional methods of food production. In fact, it is argued that bioengineering produced crops are not economically sound as it uses more pesticides than the traditional crops

[120] *Ibid.*

[121] *Genes and ingenuity: Gene patenting and human health* Report 99 (2004) 64. See http://www.austlii.edu (accessed 17 May 2016).

and the use of more pesticides could be harmful to the environment and human health.[122] The available relevant studies reflect on the current debate and validity of the existing international law governing food and agriculture in question.

Contrary to its objectives, patent law further falls short of addressing compensation to the inventor for his/her useful work. Despite the inventor's economic position, it is evident that patents afford protection only when the patentee can afford to enforce his/her rights and without the means to do so has no protection at all.[123] To move forward, it will be essential from a legal perspective to include a provision to balance the interest equitably within the framework as cost effectively and just towards all inventors, whether they are traditional or emerging, economically sound or not.

Traditionally, IP law protection means establishing exclusive property rights to grant control over a creation and to protect against exploitation in order to further creativity. Today IP law is largely seen to be used to benefit national interest in multilateral jurisdictions. The law faces new challenges such as change of technology and the expansion of trade beyond traditional jurisdictions raising various issues. The legal framework therefore needs to be reviewed accordingly.

The traditional communities contributed to the advancement of global agriculture from their traditional techniques in agriculture, discoveries and ecological knowledge of their

[122] JL Villar et al *Who benefit from genetically modified crops? Feeding the biotech giants, not the world's poor* (2009) iss 116. See http://www.foei.org (accessed 30 Nov 2016) *GMO crops mostly benefits to biotech giants not the world's poor* (2009) 6. See http://www.foei.org (accessed 30 Nov 2016).

[123] Tansey & Rajotte (2009) 17.

surroundings.[124] It is argued that most traditional plant breeding techniques considerably used in the advancement of bioengineering today and granted exclusive protection using IP have their origins there.[125]

This is not only a policy question, but an ethical one; ethics may provide the evidence of justification in one set of rules and it is important to assess the extent of the novelty of bioengineering. Currently, traditional farmers are increasingly squeezed out by commercial farmers who have ownership of most of the world's seeds through IP, while traditional farmers are increasingly being impoverished.[126] The existing IP law, therefore, falls short of equally protecting both technological and traditional ingenuity in agriculture, which should receive the same protection and promotion.

For example, the TRIPS agreement is the replication of the Paris Convention, its minimum requirements on patenting, with regard to plants, living organisms and GRs, which fall short of dualistic protection, mostly because the Paris Convention was developed for invention in inanimate objects, but is now applied to food and agriculture.[127]

It is arguable that biotechnology has benefited from available GRs and associated TKs. The significant issue here is that the innovators of biotechnology products have improved the existing GRs and associated traditional techniques, not creating something completely new.[128]

[124] The range of possible intellectual property impacts on food security identified here draws on an extensive and wide range of readings, for which I apologise.

[125] Biber-Klemm & Cottier (2008) 116.

[126] JL Villar et al.

[127] Tansey & Rajotte (2009) 7.

[128] Rimmer (2007) 24.

To support this argument the next section provides practical evidence of countries' experience in the way biotechnology innovation is using existing traditional techniques and resources.

In practice, corporations through extensive administrative support usually have free access to seed banks, the seed found from various parts of the world for conservation. All information about the seeds can thus easily be acquired.[129] For example, a patent on traditional wheat selections from India with a special baking quality was granted to Monsanto.[130] The superior quality lies in a naturally occurring combination of genes found in the grain. Monsanto now has ownership of this seed for exclusive commercial exploitation. This shows that the system under-rewards the traditional ingenuity of Indian farmers resulting in the benefits going to the company that identified the economic value thereof. The conceptual difficulties here are the moral and ethical justification of the law.

In terms of patent law, the invention must describe sufficient detail of the invention novelty, non-obviousness, usefulness and disclosure information.[131] Despite this, currently disclosure requirements are available only in certain national laws and this creates uncertainty in patent law.[132] For example, in terms of the USA Patent law the novelty requirement has a minimum application; in fact, the novelty requirement does not preclude patentability of an invention.[133] Conversely, WIPO's requirement provides that novelty is fundamental in order to determine

[129] http://www.alt.no-patent-on-seeds.org.

[130] *Ibid.*

[131] WIPO *Chapter-2 Field of Intellectual Property Protection* 3 http://www.wipo.int (accessed 1 Dec 2016).

[132] MA Desai 'Genetic resources and traditional knowledge committee' (2015) *IPO education foundation*. See http://www.ipoef.org (accessed 4 Jun 2016).

[133] AS Oddi 'Beyond obviousness: Invention Protection in the Twenty-First Century' (1989)1097 *Law Review* 38. See http://www.wci.america.edu (accessed 1 Dec 2016).

the patentability of an invention.[134] In all this the patentability requirement of an invention creates more uncertainty.

It is argued that biotechnology is not merely a discovery or a new invention, but is a substance and by-products that contain the natural plant's genes. Farmers throughout history have selectively bred crops for improved yield and identified disease resistance in plants and crops.

The current intensified and commercialised food industry has displaced traditional farmers and replaced them with industrialised farmers who are supported and protected by the law. The rationale underlines the granting of patents for emerging technology, but ignores the contribution of traditional farmers, missing the concept of justice. Agriculture cannot survive without the contribution of traditional farmers.[135] The current international food system on the one hand strengthens the corporations and enables them to take hostage the control of global food. On the other hand the system weakens the ordinary farmers. It is argued that the growing systematic technological genetic fixing in the absence of effective governing law creates an untenable environment for traditional farmers to compete in.

African food systems are taken over by corporations attracted by recent economic growth on the continent,[136] and little development opportunity is given to the local farmers. These corporations are coercing vulnerable communities due to lack of effective protection for them, and thus gain easy access to the local GRs, TK[137] and land.

[134] http://www.wipo.int.

[135] Rimmer (2007) 24.

[136] C Haigh *Carving up a Continent: How the UK government is facilitating the corporate takeover of African food systems (*2014) 4-9.

[137] *Ibid.*

In theory a corporation claims to create jobs and increase food security, but in reality jobs created by commercial farming is often poorly paid and has little impact on food security.[138] The corporations mostly produced cash crops for export and little staple foods.[139] This is evident from the fact that currently Africa has become a net importer of food. The moral and ethical justification of the law should prioritise the right to food over trade. The imported food is not affordable for the low income citizen. What is clear is that the restructuring of the existing law governing food and agriculture in a changing world is necessary.

The current IP law promotes research mainly towards the needs of the developed nations and not that of most vulnerable communities.[140] There are theoretical difficulties in the current IP provision and monopoly without ethical reasoning is wrong. Disproportionate IP protection not only hinders access to food but also hinders further invention in the traditional communities. A comprehensive and equitable system governing food and agriculture could end hunger and may bring real improvements to reduce world poverty.

The restructured law that gives incentives to GRs and associated TK will help to promote local food production and sustainable economic growth. There is no doubt that an attempt to balance any misallocation of rights of traditional invention in agriculture would provide a remedy to

[138] *Ibid.*

[139] *Ibid.*

[140] World Hunger Notes art 9 1-2. See http://www.worldhunger.org. This report further states that in order to have more innovation in the field of small farmers we need to ground our vision and our public policies on two fundamental principles. Firstly, we need participation. When you combine the experience of small farmers who knows their fields and their needs with the best of what science can offer, tremendous progress can be made. That is what happens with 'participatory plant breeding'. Secondly, we must look beyond the seed and adopt a systematic approach to agricultural innovation.

the global food crises. It is today essential to correct the wrong and ask whether the existing international food law is rational, this is perhaps an assessment of the law which could permit us to see positive development in the direction of future global food security.

2.4 BIO-PIRACY AND MISAPPROPRIATION OF GENETIC RESOURCES

Bio-piracy is defined as:

> … commercially used biological mixtures or genetic classifications by a scientific advanced state or companies without obtaining prior consent from or providing fair compensation to the community or nations in whose jurisdiction the resources were discovered.[141]

For this reason, in 1992 the CBD introduced a universal set of values detailing the way in which GRs may be accessed and how benefits that result from the utilisation of the resources, including TK, must be shared among users and providers.[142] The aim of the Access and Benefit Sharing agreements (ABS) adopted is to provide a crucial source of data to restore an understanding of the natural biosphere. It can also be used to develop a wide range of GRs for human benefit.[143]

In terms of the CBD, states have sovereign rights over GRs found in their jurisdiction.[144] The Convention confirms that the power vested in the states, as custodians of GRs, authorise them

[141] *Biopiracy* http://www.thefreedictionary.com/ (accessed 21 Feb 2016).

[142] *Introduction for access and benefit sharing* https://www.cbd.int (accessed 21 Feb 2016).

[143] https://www.cbd.int.

[144] E Kamau & G Winter *Genetic resources, traditional knowledge and the law: Solution for access and benefit sharing* (2009) 61.

to grant permission to access GRs found within their jurisdiction.[145] The users' state or company who is a party to the Convention, in return, is expected to give an equitable, fair share to the provider of the GRs.[146]

The developing countries' plants, GRs and associated TK have been accessed as free goods by the rest of the world.[147] It therefore comes as no surprise that mostly GRs and information which has been stored in various international gene banks and have been collected are easily transferred and used by corporations to systematically fix biotechnology products without prior consent or benefit sharing agreements with the provider as required by the CBD. The GRs, plants and associated TK of developing countries have been accessed freely by the rest of the world.[148]

For example, the San communities have been deprived of their deserved benefit in the case of the Devil's Claw, a plant which has been used for traditional medicinal purposes for centuries.[149] Although the indigenous plants, GRs and associated TK are supposed to be the source of the San community's local economy, the communities barely benefitted from it. It is evident that there was little research done in this regard and the detailed information is limited. This study tried to illuminate the behaviour of the corporations and the challenge which persists in these communities as a classic example of the real-life phenomenon as evidence.

[145] *Ibid.* In conformity with art 4(a) of the CBD and art 56(1)(a) UNCLOS according to which the coastal state has sovereign rights for the purpose of exploring and exploiting, conserving and managing natural resources, whether living or non-living of the water superjacent to the seabed and of the its subsoil.

[146] *Ibid.*

[147] GK More & W Tymowski *Explanatory guide to the international treaty on plant genetic resource for food and agriculture* (2005) 39.

[148] *Ibid.*

[149] http://www.rufford.org.

Another benchmark reported case is that of misappropriation with regard to the San communities' traditional plant (hoodia) and associated TK. In 2002 a dispute arose and a subsequent memorandum of understanding was followed by a benefit sharing agreement between the South African Council for Scientific and Industrial Research (CSIR) and the San community's representative.[150] The hoodia plant is traditional to the San communities and used as appetite suppressants, mostly by shepherds and hunters to curb hunger. In 1998 the CSIR filed an international patent application through the Patent Cooperation Treaty (PCT) under publication No WO98/46243, covering more than 100 countries without prior consent or a benefit sharing agreement with the community.[151] Later in 2003 the CSIR decided to license its patent to Phytopharm a United Kingdom-based company to develop and commercialise this new patent product.[152] In 2004 Phytopharm licensed the patented molecule P57 to Unilever as marketing partner.[153] Although the future of the hoodia is uncertain it also remains to be seen whether any benefit will reach to the community. More than 10 years have passed and there is no report available in this regard.

Traditionally, GRs and plants were regarded to be the common heritage of humanity until the late 1970s.[154] In the 1980s, the International Undertakings (IU) on plant and GR instruments

[150] *Case study: Hoodia plant* (2008) http://www.wipo.int (accessed 15 Feb 2017).

[151] http://www.wipo.int (2008).

[152] *Ibid.*

[153] *Ibid.*

[154] CB Onwuekwe 'The commons concept and intellectual property regime: wither plant genetic resources and traditional knowledge' (2004) 73 *Pierce Law Review* vol 2 no 1. See http://www.scholars.unh.edu (accessed 19 May 2016).

were adopted to prevent IP protection and restriction on GRs and plants.[155] The IU rejected IPRs on plants and GRs out of a concern that they might endanger the conservation of biodiversity.[156] Unfortunately, this move was not welcomed by most developed countries.[157]

The growing trend of technological genetic fixing and the property rights on food and agricultural processes and products brought the CBD into existence out of a concern raised by developing countries on the expansion of IP on plants, GRs and associated TK.[158] One of the main objectives of the CBD was to create an additional instrument, with the aim of including the sustainable use of biological resources into conservation policy.[159] The objective of the CBD focused, not only on conservation, but also on addressing socio-economic aspects related to the issue.[160] The developing countries' support for conservation is subject to the following obligations:

[155] RN Nwabueze *Biotechnology and the challenge of property: Property rights in dead bodies, body parts, & genetic information* (2007) 326. Furthermore the FAO has promoted and protected TK relevant for food and agriculture for the concept of farmer's right. The IU, however, applies only to a component of TK, for instance farmers' rights and does not apply to TK relevant to animal GRs or traditional medicinal knowledge. Thus, the latest version of IU that was adopted as a treaty in Rome in 2001 is concerned with a narrower aspect of TK by providing for the protection of traditional agriculture (2 para 326).

[156] *Ibid.*

[157] *Ibid.*

[158] SN Sullivan *Plant genetic resources and the law past, present, and future* (2004) 10-15. See http://www.ncbi.nlm.nih.gov (accessed 2 May 2016).

[159] T Greiber et al *An explanatory guide to the Nagoya Protocol on access and benefit-sharing* (2012) 3. See http://www.cbd.int (accessed 23 Feb 2016). According to art 1, the CBD has three main objectives: conservation of biological diversity; sustainable use of its components; and fair and equitable sharing of the benefits arising out of the utilisation of genetic resources (3 para 5 of the Convention).

[160] Greiber et al (2012).

1. The sovereign right of the state over the GRs and associated TK is to be protected and respected.
2. Ensuring access to technology in the same way the Convention promotes access to GRs and TK.
3. Ensuring fair and equitable benefit sharing for the utilisation of GRs and associated TK.[161]

Most developed countries are not willing to accept this aspect of the Convention and so far this effort has not been successful in practice.[162] In order to maintain and protect GRs and associated TK within the framework of the CBD in the absence of trade, there is a need for equitable benefit sharing for the utilisation of GRs. This will help the traditional communities to continue to conserve GRs and sustain their livelihood through the incentive, if available. Thus far the world has failed to prioritise the sustainable conservation of biodiversity. The International Union for the Conservation of Nature (IUCN) urges society to prioritise conservation over trade to ensure natural resources are equitably and ecologically sound.[163] This needs a precautionary approach by all parties and a political will to resolve the issue of conservation to promote food security as a priority.

[161] *Ibid.*

[162] *Ibid.* The aspect of the ABS agreement was introduced in the CBD to take into account the need to share the costs as well as the benefits of biodiversity conservation between developed and developing countries and to find ways and means of supporting practices and innovations by indigenous and local communities (4 para 3 of the Convention).

[163] D Pearce & D Moran *The economic value of biodiversity* (1994) 3.

During the negotiations of the CBD, the USA rejected the provision of the IUCN based on its dissatisfaction with the inclusion of biotechnology in the Convention.[164] Article 16 of the IUCN explicitly mentions the cooperation of parties to give access to GRs, equitable benefit sharing and transfer of technology for conservation and sustainable use of GRs and plants.[165] In 2002 the CBD Conference of the Parties gave its resolution on the global financial support to promote conservation sustainably.[166]

The CBD enforcement power is limited and no obligation is placed on the parties for non-compliance and the ratification of the parties to the Convention is detrimental to the consent.[167] The problem with the CBD is that it does not place any obligation, other than positive encouragement and compliance depends on the parties' will.

Furthermore, countries who are majority exporters of IP on biotechnology such as the USA, Canada and Argentina, have not ratified the CBD as it might hinder their countries' economic development.[168] The other fear is that it would place their countries at a financial disadvantage.[169] Nonetheless, the CBD, without question, has the opposite effect as financial contributions to be made will be determined through negotiations and parties have an effective outlawing over funding levels that they deem excessive. This is subject to the social agreements

[164] MJ Angelo et al *Reclaiming global environmental leadership: Why United States should ratify ten pending environmental treaties* (2012) 18.

[165] *Art 16. Access to and transfer of technology* http://www.cbd.int (accessed 23 Feb 2016).

[166] Biber-Klemm & Cottier (2006) 30-31.

[167] Angelo et al (2012) 19.

[168] *Ibid.*

[169] *Ibid.*

and not to encoded rules that govern human behaviour and institutions in economic and social exchange and compliance.

As the objectives of the CBD, the economic and legal measures encoded in the Convention are to encourage beneficial exchange between nations to improve fair trade. Given this, surprisingly enough the USA, not only for centuries, demonstrated its commitment for the conservation of world biodiversity, but also led the effort to get the CBD off the ground.[170] Nevertheless, the USA is not a party to the Convention and countries that have not ratified the Convention fall outside the committee's jurisdiction. As a result, parties with no obligation easily violate the CBD.[171]

Parties often try to solve their issues privately or abandon their cases with no solution. This is entirely undesirable and has serious consequences directly on food security and loss not only to biodiversity, but also associated TK, the very same thing needed to aid and promote a sustainable bionetwork. Social ethics may provide the evidence for the justification of conduct, but we chose to ignore it and suffer very serious consequences.

2.5 INTELLECTUAL PROPERTY AND ITS EFFECT ON FOOD ACCESSIBILITY

It is vital to emphasise that international treaties governing food and agriculture fall short in addressing food security and reducing hunger. Throughout history farmers have engaged in

[170] Angelo et al (2012) 18.

[171] *Ibid.*

exchanging seeds and farming practices or ideas with each other.[172] The open farming practice has been a significant concern, especially for those commercial sectors developing new varieties of seed.[173] As a result, the scope of IP law protection on bioengineered seed interferes with the traditional exercise and historical rights to save and replant seed. This prevents the free flow of seed among farmers and interferes with customary rights to seed. Farmers are forced *de facto* to buy their seed from IP protection holders[174] and this also restricts consumers' access to food. Income determines the affordability of food, not the availability.

The argument is that the concentration of power in private hands due to IP law has only enhanced commercial use and not prioritised conservation or sustainable agricultural practices. This has resulted in food being controlled by a few, ignoring the traditional practice of seed saving and sharing among ordinary farmers for purposes of breeding and cultivation.[175] This by itself disempowers the traditional farmers and dislocates them from the farming industry. In order to reduce hunger in Africa the law should promote and protect GRs and TK to help farmers to continue to adapt and innovate to increase food production and supply locally.

The latest FAO report indicates that 75% of crop diversity was lost between 1900 and 2000, and predicts that as much as 22% of the wild relatives of important plant and seed for food will disappear by 2050.[176] It is possible that more restructuring needs to be done, especially in law and policy making, to help elevate and safeguard biodiversity for food needed for the growing

[172] N Bakker & F Zenen *Farmers' seed fairs* (2011) 1. See http://www.ecohonet.org (accessed 10 Apr 2017).

[173] http://www.grain.org (2015).

[174] Rose (2011).

[175] K Aoki *Weeds, seeds and deeds: Recent skirmishes in the seed wars* (2000) 252-253.

[176] http://www.fao.org *Crop biodiversity: Use it or lose it* (2010) (accessed 23 Apr 2016).

global human population. It is argued that if the law promotes and empowers only emerging inventions and neglects traditional inventions it will be a tragedy. To find a sustainable future in international food systems there is a need to more critically look at and better understand the collaboration of traditional and emerging inventions to identify a remedy to the global food crisis and poverty alleviation. Further, the restructuring of the existing patent law will offset any misallocation of rights and resources.

At present population growth, urbanisation, economic growth and changing diets are the driving forces for the demand of food.[177] Since subsistence farmers are often forced to abandon their farming practices they end up joining the ever-growing urban unemployed. Who will feed this growing urban population and how can the system empower the vulnerable communities to be self-sustainable?

The international food systems are currently not responsive to the global food crisis.[178] In the absence of consistency in the international food system, offers deviate from a viable option to mitigate the existing food insecurity.[179] It is argued that the solutions prescribed so far are all rooted in the same existing international rules. The argument is that the existing global food law creates deeper divisions between the developing and developed world and expose the inequality of nations under existing international law, refusing to recognise countries' genuine concern for food insecurity.[180]

[177] Cooper (2008)16.

[178] E Holt-Gimenez *The world food crisis: What is behind it and what we can do* (2016). See http://www.worldhunger.org (accessed 9 Apr 2017).

[179] *Ibid.*

[180] *Ibid.*

Ownership of food in the current system raises the ethical question of how far we exercise the ownership right to food and exclude mass access to food. The growing ownership of food in the hands of a few is granting power to individuals on the basis of economic power, not on democratic principles.

The current food crisis can be ascribed to twisted agricultural policies, increased aid and deregulated global trade in agriculture. Other causes are increased technology and genetic deception, among others.[181] These practices mainly strengthen food corporations and negatively impact on the most vulnerable part of society.[182] This is dangerous as most of these companies have no social responsibility to promote and protect the right to food. It is argued that the existing IP law failed to achieve coordination with other international food systems as it was intended to effect. These will be discussed in the following chapters. It has also not provided a clear guide to adequately align itself with the international norms of conservation and the right to food.

The restriction on food imposed by companies using IP gives a competitive advantage to emerging technologies over traditional people's intellectual knowledge.[183] These communities are not only disempowered by the system, but are also hindered in their natural human rights to access the available food. The further question is how can we justify the fact that the right to IP protection is more important than the right to food?

[181] Holt-Gimenez (2016).

[182] *Ibid.*

[183] The range of possible IP and global food laws impacting on food security identified here draws on an extensive and wide range of readings, for which I apologise.

The system left the initial providers of traditional resources and knowledge without protection or incentives. The indigenous people's intellectual activities, including in agriculture, are presumed to fall in the public domain.[184] As a result, the communities remain disempowered and food insecure. The issue here is where the balance of the existing IP law should be placed equally protecting and empowering emerging technology and traditional techniques and resources as the ultimate solution to offset the improper allocation of rights and resources.

Traditional farming communities now join the urban population to buy food from the market.[185] The expanding urban population of former farming communities now buy food instead of producing it.[186] This puts pressure on the market and many are left vulnerable.[187] As a result, these communities have neither the purchasing power nor produce food themselves leaving millions depending on food aid, if available. These communities earn very little or not at all and are left with no alternatives. Social instability and poverty is heightened by insecurity about whether the existing international food systems will be able to resolve the pressure.

The promotion of IP applications in the current international food system without addressing the right to food is ethically wrong as millions are excluded from growing their economy while the interests of the rich are promoted and protected. The dynamics that are evolving are from the interaction of the empowered farmers from the developed world under the current

[184] J Gibson *Community resources: Intellectual property, international trade and protection of traditional knowledge* (2005) 55-57.

[185] FAO a policy maker guide *Food, agriculture and cities: Challenges of food and nutrition security, agriculture and ecosystem management in an urbanizing world* (2011). See http://www.fao.org (accessed 11 Apr 2017).

[186] *Ibid.*

[187] *Ibid.*

international systems with disempowered farmers from developing countries, who feel increasingly excluded from meaningful participation in economic development. This situation is therefore exacerbating food insecurity.

Restructuring the current IP system as applied to food and agriculture is vital in order to change to a new societal landscape. The inclusive regime aligned with a joint vision for the right to food could create stability and global food security. An equitable way must be instituted to balance the right to food and IP protection as this is crucial to address the issue of food insecurity. This can only be met by international and national policy makers collaborating and cooperating in the formulation of the new system and in so doing finding lasting solutions for food insecurity.

2.6 CONCLUSION

The purpose of the above exposition of the gradually growing emergency of the global food crisis was not only to detail some of the fundamental gaps in patent law and the key provision of the relevant conventions and treaties, but also to provide a background for the argument which will be made in the following chapters.

It is argued that unless nations, institutions and private sectors are committed to compliance with the provisions, the mere creation of a legal framework does not solve the problem. The restructuring of the systems should be based on equal participation of all parties concerned as a prerequisite.

The appropriate protection of GRs and plants centres on the question whether changes are needed to the existing boundaries in current international regimes to address the chronic situation of food insecurity, poverty – especially in Africa – and how the changes could be implemented.

The available instruments failed to serve both emerging technology and traditional invention to promote and protect all parties equitably. As a result the traditional communities are deprived of the fair opportunity to benefit from their informal practices. It becomes apparent in the light of the distribution of justice, that the participation of all nations in the formulation of the legal framework is necessary. Any successful outcome in this area depends on the capacity building for traditional communities that are a necessity to make informed decisions about what options they have available and are appropriate in this regard.

The mix of and complex existing international rules that govern agriculture and food create non-inclusiveness and prevent ordinary farmers from progressing in farming. As a consequence the traditional farmers are dislocated from farming practices and due to the erosion of biodiversity and knowledge, these farmers are lost altogether. The latest FAO report as described above indicates that 75% of crop diversity was lost and predict that as much as 22% of the wild relatives of import plant and seed for food will disappear by 2050. It is important that changes to laws must be made to help elevate and preserve cultural practices and safeguard biodiversity for food needed for the growing global human population.

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CHAPTER 3

CHAPTER 3

The Ongoing Discussions on Food Security

3.1 INTRODUCTION

Lord John, the first director general of the Food and Agriculture Organisation (FAO) said: 'You cannot build peace an empty stomach.'[188]

In support of this statement there is nothing you can do if you are hungry; man loses rationality to build peace when he/she is hungry.

[188] *The Green Revolution* (2014). See http://www.prezi.com (accessed 24 Jan 2016).

This chapter focuses on the ongoing discussion of food security at various global forums, which has been a challenge for decades. The chapter will briefly examine global food and agriculture law, including IP law, in the approach to food security identify the challenge and expose the gap created by the current international food systems.

For the purpose of this thesis, the definition of food security given by the World Food Summit (1996) is used. This states that:

> All people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.[189]

Based on this definition, the state has a positive duty to advance food availability and accessibility all the time to her citizens.

Food is a source of power for the human body. If one has sufficient food, one feels healthy and capable of being productive.[190] A lack of food not only causes loss of energy, but also loss of productivity, well-being, as well as dignity. The academic performance of children in school also depends on the food they eat.[191]

In human history, survival has been a fight for resources such as food.[192] Food insecurity, one of the paradoxes of modern society, is a complex issue caused by various factors and it has

[189] *Food security to meet dietary needs for active and healthy lives*. See http://www.fao.org (accessed 9 Mar 2015).

[190] *Trade reforms and food security:* Chapter 2, 2. See http://www.fao.org (accessed 9 Mar 2015).

[191] A Woodhouse & M Lamport *The relationship of food and academic performance* (2012) 3 vol 5 iss 1.

[192] *The grand finale: World War III will be a fight over basic human needs* (2015). See http://www.beforeitsnews.com (accessed 20 Jun 2016).

serious consequences for basic human rights, as well as the potential to ignite conflict, crime and reduce people's potential to be productive and live a life of dignity and well-being.[193]

Borlaug, in his Nobel lecture stated:

> Man seems to insist on ignoring the lessons available from history.[194]

Without food on the table, trade negotiations or any kind of social justice, loose their meaning. The priority has to be to remove all factors that affect food security, starting from the rules and instruments governing food and agriculture, which are detrimental to global food security.

In terms of the World Bank report in 2013, despite the world's impressive economic development, the developing countries' poverty has been in increasing from 21% in 1981 to 59% in 2010.[195] It is argued that this was often created by changing farming methods from centuries-old farming practices to bioengineering and the high cost of buying those seeds and is argued as further aggravating global poverty levels.[196]

Contemporary studies suggest that the demand for food in the world continues to increase. African populations are increasing, yet food production on the continent is unable to increase at the same rate. As a result the continent has become a net importer of food to satisfy the

[193] *Ibid.*

[194] Borlaug (1970).

[195] *Remarkable decline in global poverty, but major challenges remain* (2013). See http://www.worldbank.org (accessed 9 Dec 2016).

[196] O Hospes & I Hadiprayitno *Governing food security: Law, politics and the right to food* (2010) 275.

increasing demand for food. According to the World Bank the demand for food will double by 2020, with the majority of consumers located in Africa.[197]

3.2 FOOD INSECURITY

This section provides a very brief description of food security, in order for readers to grasp the content. Food security from the legal point of view is human right to adequate food. 'Rights to food' is enshrined in international law and states provide legal protection to individual rights to adequate food the national level through national constitutions.

Food insecurity is the lack of access to food.[198] If a country fails to produce food locally, it may source food through imports. This practice does not guarantee accessibility as the provision of food depends on the economic power of the people. In various parts of the world there is overproduction and overconsumption of food, yet in contrast, in other parts of the world, almost a billion people are struck by hunger every day.[199]

In 2016 FAO reported that there are 800 million people undernourished and at the same time more than 2 billion people are over nourished on the globe.[200] The reason that the international food system faces multiple challenges among others is due to overconsumption, rising food

[197] *Africa can help feed Africa: Removing barriers to regional trade in food staple* (2012). See http://www.siteresources.worldbank.org (accessed 18 Aug 2016).

[198] www.beforeitsnews.com (2015).

[199] *The nutrition puzzle* (2012). See http://www.economist.com (accessed 20 Jun 2016).

[200] *Food losses and waste: A challenge to sustainable development* (2016). See http://www.fao.org (accessed 2 Feb 2017).

prices, population growth and rapid diet transitions. It is thus necessary to review the global food law.

In 2014 the UN out of a concern sent a special reporting envoy to evaluate the relationship between IP rights and the right to food.[201] Part of this report shows that the current IP law is falling short to ensure global food security.[202] The group recommended new international seed policies that encourage invention, promote food security and enhance agriculture, further respect, protect and fulfil the right to food of the most vulnerable communities.[203]

The biggest threat to food security, other than high food prices, is ineffective norms and instruments governing food and agriculture.[204] The IP systems are among the few other forces and norms shaping the food supply, production systems and the control of food. To stop food wastage and the unbalanced distribution of food, there is a need for changes that have to be implemented at every stage of the food production and supply chain, which ultimately will mitigate the current global food crisis.

Being dependent on imported food is not in the best interest of any nation, nor does it bring food security to the people. Rather, it can easily be manipulated and used as a political tool to corrupt the leaders, influence policies and affect the development of local production.[205] The existing imbalance in trade rules governing agriculture requires substantial forms of reform to

[201] SE Mahgoub *Genetically modified foods: Basics, applications, and controversy* (2015) 211.

[202] *Ibid.*

[203] *Ibid.*

[204] *Trade and environments review: Make agriculture truly sustainable now for food security in a changing climate* (2013) 252-253. See http://www.unctad.org (accessed 2 Feb 2017).

[205] *Ibid.*

create a more fair global trading system that could make a positive contribution to food security.[206]

Currently, the diets of the population of the world are changing drastically as the market provides convenience and a variety of food.[207] Ordinary people, including farmers, are coerced to join the majority to consume mass produced food rather than their own products. In February 2016, a report suggested that, in Venezuela farmers are forced by the government to hand over their crops.[208] This long series of very bad decisions by their leaders caused farmers to buy food from the market rather than producing it themselves and the resulting lack of local production is currently causing a national nutritional emergency.[209]

Cash crops, in economic terms, might make sense, but producing cash crops at the expense of local staple foods, where the cash crops' price declines, leads to economic collapse and food insecurity.[210] That is why promoting local staple foods would improve local food security. It is equally vital to make agriculture sustainable for enhanced food security in the currently changing ecosystem on the globe.

[206] *Ibid.*

[207] *Global food crisis: The challenge of change diets* (2011). See http://www.theguardian.com (accessed 22 Jun 2016).

[208] *Venezuela is out of food: Here's what an economic collapse really looks like* (2016) http://www.activist.com (accessed 12 Jun 2016).

[209] http://www.activist.com (2016).

[210] WM Kenya & A Churieklhauge. *Tunza: acting for a better world* (2003) 102. Tunza means to treat with care or affection. See http://www.unep.org/Tunza UN environment Programme (accessed 9 Mar 2015).

A report published by the South African Department of Agriculture in August 2013 states that South Africa still faces serious food security challenges. According to the report, 13.8 million individuals in South Africa experienced inadequate access to food in 2013.[211]

Furthermore, the South African government's national policy report on food security explains that the contributory lack of adequate access to food by its citizens is due to globalisation, existing ineffective international trade regimes and the poor distribution of food, among other factors.[212]

The imported food available in the market is quite expensive for low income families. In 2014 alone for example, South Africa imported agricultural products to the value of US$ 5.9 billion, the highest in the region, followed by Angola that imported US$ 4.1 billion.[213] This is an indication that despite Africa's potential for agricultural development, the continent remains a net importer of food. This situation is unrealistic as to import food rather than producing locally at lower cost, is unsustainable considering that the majority of the people are in a low income group and unable to access expensive food in the market.

African countries have fallen behind the rest of the world economy as it stands now in contrast with their populations that are increasing.[214] Present studies indicate that the demand for food

[211] *National policy on food and nutrition security.* See http://www.nda.agric.za (accessed 9 Mar 2015).

[212] *Ibid.*

[213] A Inouye *Exporting trade mission, sub-Saharan Africa* (2015). See http://www.fas.usda.org *Turning point agricultural export to sub-Saharan Africa* (accessed 6 Sep 2016).

[214] The Guardian: *Why has Africa fallen behind the rest of the world's economics?* 4 Aug 2014 (accessed 5 Aug 2016).

in the world continues to increase,[215] whereas the number of farmers in Africa is decreasing. It is envisaged that the demand for food will double by 2020, with the majority of the consumers located in Africa.[216]

The food market on the African Continent is the missed opportunity for the continent's farmers and traders. In 2013, the World Bank reported that Africa's food market possesses the potential to create a trillion-dollar food market.[217] The continent's development in trade lags behind the rest of the world and it is unable to effectively participate in international negotiations with the rest of the world due to the knowledge gap.[218] Agriculture is the backbone of Africa's economies and it is a perfect opportunity for leaders identifying the potential within and exploiting the available market with low cost increased local agricultural products rather than importing, to resolve the issue of food insecurity.

The world's food production per capita shows that there is a steady increase in production and enough food for everyone.[219] The increased production of food in other parts of the world could not provide a solution for Africa; it has to be produced locally. Currently, 805 million people in the world are considered to be living with chronic hunger of which the majority is found in Africa.[220] This shows that food insecurity is not only caused by a shortage of food on the globe,

[215] P Brenton et al *Africa can help feed Africa: Removing barriers to regional trade in food staple* (2012). See http://www.siteresources.worldbank.org (accessed 12 Aug 2016).

[216] *Ibid.*

[217] *Ibid.*

[218] PB Payoyo *Cries of the sea: World inequality sustainable development and the common* (1995) 89.

[219] *World hunger and poverty facts and statistics by WHES* (2015). See http://www.worldhunger.org (accessed 11 Mar 2015).

[220] *Ibid.*

but the source of income of countries to pay the bill determines whether you can afford to get it or not. Overproduction in other parts of the world does not guarantee accessibility.

Often, efforts by the local government to encourage economic growth have not been helpful to resolve the issue of food insecurity. In contrast they have unknowingly contributed to the deteriorating situation by allowing multinational corporations to take ownership of land for cash crops, indigenous grain and plants and associated TK.[221]

Local farmers are often unable to sustain their farming practices due to various reasons, for example, IP protection limits the access to new commercial seed varieties for small-holder farmers and decreases the affordability of food to the local communities.[222] The misallocation of rights and lack of protection to traditional invention and resources causing loss of potential income have not been considered by the developed countries as damaging the indigenous people's economy. The existing system regards GRs and associated TK as public domain,[223] while GRs and associated TK are freely accessed and often others are reaping the benefits. Where is the moral and the ethical justification of the current IP law?

The problem traditional people face today is not only about governance, but also about control of ownership of their knowledge and resources. Indigenous knowledge and resources could be used to alleviate poverty and steady local economies. However, disregard for TK and resources could have a negative effect and lead to misappropriations and dislocate the communities from participation in the global economy.

[221] *Seed laws that criminalise farmers* (2015). See http://www.grain.org (accessed 13 Mar 2015).

[222] *Ibid.*

[223] *IP* http://www.wipo.int (accessed 12 Dec 2016).

It is very important and vital to have local interventions, strategies and protection of the available knowledge and resources as a first priority before resorting to regional or international protection. Much more work is needed to adapt legal frameworks to local circumstances and needs.

The question is how to identify the degree of danger, problems and opportunities for indigenous GRs and associated TK through the lens of existing international food law and IP law, which are mostly formulated by political delegates rather than experts. Various studies suggest that the elements of economic life such as capital, labour, credit, money and liquidity are creatures of law.[224] What is clear is that the formulation of the proposed modification requires due diligence and commitment from leaders to bring legal certainty to the agricultural industries and to address food security on the way forward.

3.3 FOOD WASTAGE

The UN summit on the Environmental Impact of Food Wastage in 2013 estimated that one in nine individuals in the world does not have access to sufficient food to lead a healthy life.[225] It is further reported that the number of people dying from hunger every day, equal the number of people dying of Aids, malaria and tuberculosis combined.[226] The inefficiency of the

[224] D Kennedy 'International legal theory: Law and the political economy of the world', 26 *Leiden Journal of International Law* 7 (2013) 3. See http://www.nrs.harvard.edu (accessed 16 Feb 2017).

[225] *The environmental impact of food wastage* (2015). See http//www.moveforhunger.org (accessed 16 Feb 2017).

[226] *Ibid*. Food wastage is a missed opportunity to improve global food security and the use of resources from food chains to mitigate environmental impact.

international food law is alarming, to the extent that globally one third of food produced for consumption is wasted.[227]

In some parts of the world there is overproduction leading to overconsumption.[228] Wastage can happen during the production, handling, storage, processing, distribution and consumption stages. As a result, wasted food harms the environment and biodiversity.[229] On average 1.3 billion tons of food, worth 750 billion US$ is wasted every year, especially in the developed world where there is a 31-39% wastage of food compared to the low income world with 4-16%.[230] The FAO estimates that every year approximately one third of all food produced for human consumption in the world is wasted in one way or another.[231]

According to the study, global food waste costs the world unpredictable market prices for food and nearly one billion people left hungry every day.[232] This is because of an ineffective legal system together with food wasted by farmers, manufacturers, supermarkets and consumers, which could feed the entire world's hungry people.[233] Even though in Sub-Saharan Africa one in four people are under nourished from lack of food, between 30-40% of food produced in Africa is lost or wasted post-harvest and processing, which could feed 300 million people.[234]

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[227] D Evans *Food waste: Home consumption, material culture and everyday life* (2014) 7.

[228] *Environmental Program News* (2013). See http//undep.org (accessed 23 Jan 2016).

[229] *Food-wastage* (2013). See http://www.greenfacts.org (accessed 23 Jan 2016).

[230] http://www.greenfacts.org.

[231] *Ibid.* The report further states that the impact of food wastage on environment, the carbon footprint of food produced and not eaten is estimated to 3.3 G tonnes of CO_2-equivalent.

[232] T Stuart *Uncovering the global food scandal* (2009). See http://www.books.wwnorton.com (accessed 13 Dec 2016).

[233] *Ibid.*

[234] *Key facts on food loss and waste you should know!* See http://www.fao.org (accessed 20 Feb 2017).

It is thus fair to argue that the current international food system has failed to mitigate the persistent world food insecurity. According to the Natural Resources Defence Council (NRDC) studies in 2010 the USA alone wasted 40% of food produced, which could feed more than 25 million people, despite this one in seven American's lack access to food.[235]

The call by anti-poverty campaigners and those opposed food waste in France brought a petition and in December 2015 the French National Assembly for the first time passed a law to ban food waste by supermarkets.[236] On 2 August 2016 Italy passed a new law to cut food waste by 1 million tons per annum.[237] Italy estimated that the amount of food wasted cost the country 12 billion Euros per annum.[238] In 2013 alone the CSIR of South Africa in its studies showed that South Africa wasted approximately 31.4% of the food produced per annum.[239] A call for new law to eliminate or manage food waste in the midst of one in four people being unable to access food in Africa is inevitable as the reverse threatens countries' stability further.

The world is facing multiple challenges with regard to food security including food waste, overconsumption, rising food prices, population growth and rapid diet transition. The current global food systems are unable to resolve the global food crisis. Food insecurity threatens

[235] D Gunders *Wasted: How America is losing up to 40% of its food from farm to fork to landfill* (2012). See http://www.nrdc.org (accessed 14 Dec 2016).

[236] *French law forbids food waste by supermarket* (2016). See http://www.theguardian.com (accessed 14 Dec 2016).

[237] K Martinko *Italy new laws aim to cut food waste by 1 million tons per year* (2016). See http://www.treehugger.com (accessed 20 Feb 2017).

[238] *Ibid.*

[239] S Oelofse *Food waste in South Africa/Africa: Opportunities and challenges* (2013). See http://www.gdard.gpg.gov.za (accessed 14 Dec 2016).

countries' political and economic stability, the degradation of natural resources, migration to urban areas and across borders. It is therefore important to review the law in order to institute the most appropriate means to achieve and facilitate an end to hunger.

3.4 RIGHT TO FOOD

The right to food does not warrant the distribution of free food to all citizens, rather it advocates the moral duty of a government to take sufficient steps in order to ensure adequate food availability and accessibility at all times to its citizens.

The South African Constitution of 1996 states that everyone has the right of access to food, and places a duty on the government to take steps to ensure food security to its citizens.[240] Section 28 of the Constitution confirms the right of every child to sufficient food.[241]

The UDHR1949, states that everyone has the right to food. [242] Furthermore, the ICESCR of 1966 clearly recognises the right to food and the fundamental right of every person to be free from hunger.[243]

From the above-mentioned instruments, it is clear that the right to adequate food should be given the highest consideration to ensure the well-being of any society. In terms of the UDHR,

[240] S 27 of the Constitution of the Republic of South Africa, 1996.

[241] S 28 of the Constitution.

[242] *The human right to adequate food and freedom from hunger*. See http://www.fao.org (accessed 13 Mar 2015).

[243] *The right to adequate food* http://www.ohchr.org (accessed 13 Mar 2015).

in the quest for the advancement of human welfare and development, citizens should be granted accessible food at all times.[244]

Furthermore, the International Labour Organisation (ILO) preamble states the following: 'Universal and lasting peace can be established only if it is based upon social justice.'[245]

All of the above-mentioned instruments serve as a reminder of how social justice is paramount and how the right to food remains absolute.

One of the components of social justice should be adequate food for all humanity, yet today almost one billion people are affected by hunger and starvation worldwide.[246] The recent report by World Food Program states that almost 795 million people in the world do not have adequate food to lead a productive life, which is about one in nine people in the world that does not have access to sufficient food.[247]

All other components of social justice will be meaningless without food. **Lord John**, the first director general of the FAO, in his speech said '… you cannot build peace on empty stomachs'.[248]

[244] *Food security as defined by FAO.* See http://aciar.gov (accessed 23 Jan 2016). When all people at all times have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.

[245] *The International Labour Organisation (ILO) purpose.* See http://www.nationsencyclopedia.com (accessed 24 Jan 2016).

[246] http://www.worldhunger.org/hunger/statistics.

[247] https://www.wfp.org/hunger/statistics (2015).

[248] *The green revolution* (2014). See http://www.prezi.com (accessed 24 Jan 2016).

The above statement is supported the fact that it is apparent that the existing international law has failed to adequately protect and recognise the right to food of the global citizenry. Furthermore, the system failed to respect and reserve culture and tradition in farming. Currently there is no compulsory disclosure provision in IP law that could capture all the existing concerns about traditional plant, GRs and associated TK relevant to patented inventions. As a result, social and political instability provoked by food insecurity persist among the vulnerable communities of the globe.

3.5 HISTORICAL DEVELOPMENT OF PLANT VARIETY PROTECTION

The 1833 declaration, called the Papal States Edict, for the protection of new inventions and discoveries of technology and agriculture[249] had no effects or features to encourage invention in plant breeding.[250] In 1865, Mendel published experiments on the principles of heredity in plant breeding. As a result, the plant-breeding industry was established with the focus on food security.[251] The plant-breeding industry soon changed into corporations and moved away from saving and conserving seed to the ownership and marketing of seed.[252] The development of ownership of seed resulted in new rules and regulations, which promote only the interests of corporations. As a result, the promotion of food security is jeopardised.

[249] Blakeney (2009) 79. See B Laclaviere, La protection des droits des obtenteurs sur les nouvelles especes ou varieties des plantes et la Convention de Paris du 2 December 1961 pour la protection des obtentions vegetales (April 1962) no 168. Bulletin D'Information des ingenieurs des Services Agricoles, cited in A Heitz *The history of UPOV convention and the rationale for the protection of plant varieties under the UPOV Convention, Buenos Aire*, 26-27 November (1991).

[250] *Ibid.*

[251] *The state of food and agriculture* (2003-2004) 3. See http://www.fao.org (accessed 23 May 2016).

[252] *Ibid.*

In 1930, the USA introduced the Townsend Parnell Act to protect plant varieties for the recognition of agricultural innovation.[253] In 1937, Cuba introduced a similar plant patent Act with the USA, followed by South Africa in 1952 and the Republic of Korea in 1973.[254] In 1922, France introduced a decree which promoted the registration of new varieties of plants,[255] and in 1932, the Netherlands introduced seed certification.[256] In 1953, the German law introduced the protection of plant varieties and seeds of cultivated plants, with the intention to protect the useful new varieties of cultivated plants.[257] The objective of enacting new international seed law was to ensure the quest for the distribution of justice among users and providers of seed for sustainable agricultural practice. It is arguable whether it has achieved its goal or not.

The inclusion of IP protection in agricultural innovation brought about demands of the corporations and associations to protect plant varieties.[258] In 1927, the International Institute of Agriculture voiced its own concerns that the reproduction of plant varieties for sale without royalty payable to the producer is not acceptable.[259] The Second World War interrupted all the development in this regard until 1957.[260] In 1957, the French Government invited European

[253] Blakeney (2009) 80. See 35 U.S.C. S (2000) 161-164.

[254] *Ibid.*

[255] Blakeney (2009) 81.

[256] *Ibid.*

[257] M Llewelyn & M Adcock *European plant intellectual property* (2006) 137.

[258] *Intellectual property, traditional knowledge and genetic resources: Policy, law and current trends* (2004) 16. See http://www.wipo.int (accessed 24 May 2016).

[259]*The relationship between intellectual property rights (TRIPS) and food security* (2004) 6. See http://www.trade.ec.europa.eu (accessed 24 May 2016).

[260] *Postwar period through the 1950s* (1993). See http://www.ic.galegroup.com (accessed 24 May 2016).

countries to attend a conference to discuss the issue of the establishment of an international system to protect plant varieties.[261] As a result, the UPOV was adopted in 1961.[262]

The UPOV Convention deals with the ownership of plant varieties and the right of breeders. The provision of the UPOV Convention established a specific system of IP tailored to protect PBRs, also called Plant Varity Protection (PVP). These rights are similar to patents and copyrights, giving the breeder of a new plant variety the exclusive rights of ownership over the product.

The purpose of the provision of UPOV was that all member states of the Convention were expected to protect and promote the right of breeders. The provision explicitly specified certain species annexed in the Convention: wheat, barley, oats or rice, maize, potato, peas, beans, lucerne, red clover, ryegrass, lettuce, apples, roses or carnations and few others; but in 1978, this list was removed and member states agreed on a list of only five species to be given protection.[263] The UPOV has since been reviewed and additional provisions have been inserted multiple times.

In 1991, UPOV broadened its provision, requiring the new member states to protect 15 plant varieties and within 10 years of their membership to protect, all plant varieties.[264] The Convention furthermore restricted breeders from using protected plant varieties to create

[261] CM Correa *Plant varieties protection in developing countries: A tool for designing a sui generis plant variety protection system: Alternative to UPOV 1991* (2015) 9.

[262] *Ibid.*

[263] Blakeney (2009) 84-85.

[264] *Ibid* 86. See also art 3(2) of Act of 1991 of UPOV.

another.[265] The 1991 Convention is so controversial that farmers are prohibited from exchanging seeds or selling seed for cultivation purposes, as well as from conducting natural selection in their fields.[266]

Although UPOV is not an explicitly introduced patent, its objectives from inception share similar basic characteristics with patent and that is to protect the interests of commercial farmers through breeder's rights.[267] The provision was designed to protect the right of those farmers able to develop and discover seed and plant varieties through bioengineering and not traditional breeders. The argument on the formulation of the UPOV provision contained specific characteristics of large scale farmers, but did not fit most developing countries' small-scale farmers.[268] Despite UPOV being unfit for developing countries' breeders it is obligatory for them to adopt it by their mere membership of the WTO.[269]

Traditionally farmers swapped and shared their seed for farming amongst each other, but now became more and more reliant upon private seed supplies.[270] The criminalisation of seed swap and share hinders the free movement of seed for farming, which is still prevalent in many developing countries and has severe consequences for food security. Although plant variety certificates in terms of UPOV are lower in number compared to plant patents, both hinder access to food by vulnerable communities. In 2007 alone, the USA filed 436 plant variety

[265] *Ibid*. UPOV 1991 allowed protected plant varieties to be used for research and selection but this was not extended to farmers conducting selection in their field. It can therefore only benefit industries and researchers.

[266] http://www.grain.org (2015).

[267] Biber-Klemm & Cottier (2008) 80-81.

[268] Tansey & Rajotte (2009) 40-41.

[269] *Ibid.*

[270] Lightbourne (2009) 3.

certificates and 1 049 plant patents, Japan filed 1 406 plant variety certificates in the same year, followed by 2 977 plant variety applications by the EU.[271] None were from Africa.

In 1999, the foreign ministers of the Organisation for African Unity (OAU) addressed their concern on IPR protection for plant species, which are not inclusive of protecting African indigenous plant species, considering the fact that the traditional farming practices and the system in Africa are under-developed compared with their counterparts in the developed world.[272] African countries have no knowledge for quantifying or identifying their own plant varieties sufficiently to participate fully in the Convention.[273] The regime as it stands now is problematic, considering the difference in the countries' knowledge, economic strength and priorities. The issue here is one of many questions to which no single global answer could be given.

The TRIPS agreements seek to establish enforceable universal minimum protection for plant varieties. Article 27(3)(b) in particular provides plant varieties protection either by patent or any other available system of protection to comply with the provisions of the TRIPS agreement.[274] Although Article 8 of the TRIPS agreement stresses that member states are to adopt a mechanism to protect public health and nutrition, Article 27 of the TRIPS agreement, places an obligation on the member states to protect plant varieties and in case of conflict the agreement clearly recommends that Article 27(3)(b) is paramount.[275] This means that the

[271] Blakeney (2009) 59. See Document UPOV C/42/7.pdf available at http:www.upov.int (accessed 4 Nov 2015).

[272] M Blakeney 'Intellectual property, traditional knowledge and genetic resources: Policy, law and current trends' (2004) 4. See http://www.wipo.ip (accessed 30 May 2016).

[273] *Ibid.*

[274] RE Venson & V Santaniello *Regulation of agricultural biotechnology* (2004) 110.

[275] Blakeney (2009) 87.

TRIPS agreement further gives supreme importance to Article 27(3)(b) in case of inconsistency. This clearly shows that the provision gives protection to plant varieties, but ignores the right to food. As a result many developing countries view IPR on agricultural plant varieties as a policy that seems to serve only the interests of corporations at the expense of the small local agricultural sectors.[276] This regulation does not provide countries with the autonomy to choose whether the regime would best benefit their social, economic and technological development.

Contrary to the TRIPS agreement, the CBD advocates the role to be played by indigenous communities to conserve and maintain biodiversity. The Convention prioritised conservation to ensure that natural resources are equitably shared and a sustainable farming culture must be encouraged and protected for future generations. TRIPS's approaches are different from those of the CBD, as TRIPS prioritised trade and the profit aspect of food and agriculture, based on the concept of private property rights. Existing IP norms, therefore, are in conflict with the production and administration of food and agriculture, which makes sustainability questionable. It is of fundamental importance to develop a new framework in order to address food security sufficiently.

In the beginning, the Consultative Group on International Agricultural Research (CGIAR) established a system to support and improve food security and reduce poverty.[277] The research resulting from this was freely available to researchers, plant breeders and farmers globally. In March 2012, this privilege was suspended and in certain circumstances, its research activities

[276] Venson & Santaniello (2004) 110.

[277] Lightbourne (2009)164-165.

and outputs have IP protection for the exclusive use of the Centre.[278] This restricts subsistence farmers' access to new research findings to improve local production. The existing systems with regard to food and agriculture thus fail to balance the right to food and the right to property.

3.6 CONCLUSION

In conclusion, even though IP created a market-based reason for the conservation, innovation and use of agricultural products, it also pushes agriculture beyond natural limits for profits, which has a serious consequence for the environment, indigenous people and a loss of biodiversity. Food is the sustenance and source of nourishment to humanity, improving plant varieties is one thing, designing sustainable farming systems is another. It requires a more holistic approach, beyond market based law and technologies. The system must be up-scaled to promote and protect the interests of marginalised communities as well.

With the rapidly changing weather conditions and with the increased uncertainty about almost everything, there is a need for a new approach and radical way of thinking. Small-holder farmers are better equipped to secure local food sources and produce food for the poor than multinational researchers and high-tech corporations that focus only on cash crops. When cash crops collapse the high-tech corporation's jobs for the locals will also collapse. This may result in locals having no income or means to buy staple foods. It is vital to promote locally produced food, given the right support and legal frameworks are in place.

[278] *Ibid.*

Food insecurity, especially in Africa, is at a critical stage and needs to be addressed as a matter of urgency. The poor performance of complex existing food law is unable to provide answers to the global food crisis and the suggested review of IP law alone may not provide all the answers to the question of food security. However, the growing global influence of IP law on food and agriculture needs to be addressed and not be neglected.

The increasing complexity of various international treaties on food and the growing transformation of food production and supply chain systems in the market place, have highlighted the inefficiency of the present food system. The system has failed to balance the right to food equitably with IP rights.

Currently, the world is entering a critical phase where food security is threatened by factors such as increased urbanisation, the inability to balance this with the growing human population and the availability and the accessibility of the food supply.

In addition to changes in communities' dietary requirements, the loss of traditional food systems has resulted in a shift to modern food consumption patterns. The only food that the poor can afford is cheaper food that is unhealthy or is often barely accessible to the vulnerable communities. This shift in consumption and food needs puts further strain on the availability and affordability of good food amongst the world's needy and growing population.

In contrast, small-scale farmers are squeezed out of the market due to changing trade requirements and competition from big commercial farmers. The rapidly growing food economy and its control by giant supermarkets have placed a further constraint on production systems and fair practices, leaving small-scale farmers in a critical position, unable to effectively negotiate future incentives.

The constant demand for the forceful endorsement of an industrialised and privatised model of food production, which dominates in international trade and IP rule settings, has failed to secure stable and sustainable access to food for the vulnerable communities.

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CHAPTER 4

CHAPTER 4

Patents, Agriculture and Innovation

4.1 INTRODUCTION

The overall purpose of this chapter is to study the economic analysis of patents and more importantly, to expose some of the apparent shortcomings in current patent law in terms of addressing their social benefit and its effect on global welfare. Furthermore, this chapter contains a discussion on the application of patents on agricultural innovations and the effect thereof on food security. It is followed by a discussion on the WTO and the WIPO contribution in forming international IP law in agriculture.

The first mechanism for the protection of patent establishment prominently started in the 15th Century.[279] The system has been portrayed as an incentive to promote inventions and has been

[279] *Patent law, economic development and patents.* See http://www.wipo.int (accessed 26 Jan 2016) 1.

used as a tool to create economical wealth for the inventor.[280] It is also believed to promote social benefits at the same time.[281] It is questionable whether or not the existing patent law truly promotes social benefits where their economic logic is focused on commercial incentive schemes.

In 2014, there were negotiations at WIPO between developing and developed countries, questioning the effectiveness of existing international patent law.[282] The aims of the negotiations were to reach an agreement to adopt a new international instrument to find an appropriate balance for the protection for indigenous GRs and TK.[283] The study showed that the practice of using GMO in order to create improved food sources had often compromised the development of agricultural resources for both local and indigenous people as well as rural farmers.[284] An agreement at the negotiations at WIPO has not yet been reached.[285]

The developing countries expressed their invalidation of the current patent system with regard to the scope of its disclosure requirement, where GRs and associated TK are used to create biotechnology, which qualifies for patent protection.[286] This discourse happened without

[280] S Anderman *The interface between IP rights and competition policy* (2002). See www.cambrige.org (accessed 1 Jul 2016).

[281] *Ibid.*

[282] Desai (2015) 2.

[283] *Making international IP law* (2014) 4-5 http://www.wipo.int (accessed 3 Jun 2016). The objective of developing countries, in particular, is to ensure the IP system discuses all knowledge systems and identifies the contribution that has been made - and continues to be made by TK systems. In fact, all countries have an interest in the fullness and widest possible recognition of the international IP system.

[284] Secretariat of the CBD 'Interdependence of biodiversity and development under global change' *CBD Technical Series* no 54 (2010) 114.

[285] WIPO (2014).

[286] *Ibid.*

regard to the two major contributory resources that are used in the creation of biotechnology.[287] The term biotechnology broadly defines any method using living organisms or parts of organisms to make or modify a product.[288] By its definition and application this creates international and multicultural conflicts and debates on existing patent law.

Most developing countries continue to express their dissatisfaction with the current patent rules and their application. This dissatisfaction with the current system stems from the practice of the misappropriation of GRs, as well as the fact that skills and practices developed by farmers, identified as new inventions, have not been addressed sufficiently.[289] It is their view that the current patent law is not protecting their interests and the application of current patent law is improper and has incomplete disclosure requirements.[290]

There seems to be a notion held by most developing countries to disregard the ingenuity of most innovations granted as protection under current patent law.[291] It is most important that biotechnology innovations should not be a substitute for traditional agriculture, but rather that it should complement the existing conventional methods of agriculture and GRs in order to promote local food security. There is a disproportionate level of economic power and a distinct knowledge gap that exists amongst nations that are unable to utilise the system equitably. The

[287] WIPO (2014).

[288] *Intellectual property rights for biotechnology* (1992). See http://www.ciesin.org (accessed 3 Jan 2016). Mankind has used forms of biotechnology since the dawn of civilisation. However, it has been the recent development of new biological techniques which has raised fundamental social and moral questions and created problems in intellectual property rights. 495-99.

[289] *Patents on life patently undermine food security*. See http//www.institute of science in society.org.uk (accessed 27 Jan 2016).

[290] Desai (2015) *2.*

[291] *Ibid.*

system must be duty-bound to promote and protect traditional methods and GRs and must be better adapted to the different social settings in order to find an appropriate balance.

4.2 PATENTS AND ECONOMICS

Although patents are one of the oldest rules that promote and protect innovation, there is very little information available on their economic value. In practice, the current patent systems are more unfavourable than beneficial, particularly to the least-developed societies.[292] Most importantly, the system prioritised trade and profit over conservation and food security. It is also argued that the existing patent law often neglects social benefits and cost.[293]

The number of patent applications and claims per application are increasing annually. In 1992, there were 600 000 patent applications filed from Europe, Japan and the USA, and by 2002, this number had increased to 850 000, a trend reflected in the related claims generated.[294]

According to executive summaries of the 2013 reports the world's five largest IP offices, by the end of 2012, there were 8.5 million patents filed and 90% of them put into force globally.[295]

[292] AS Oddi 'The International patent system and third world development: reality or myth' (1987) *Duke Law Journal* vol 36 no 5 832. We are in the era of great imbalance in international trade where the imbalance created pressure in the international market contrary to free trade agreements. See http://www.scholarship.law (accessed 3 Jun 2016).

[293] HVJ Moir *What are the costs and benefits of patent systems?* (2008) 1. See C Arup & W van Caenegem *Intellectual property policy reform: fostering innovation and development* (2009) 267-284.

[294] *Patent and innovation: Trend and policy challenges* (2004) 8. See http://www.oecd.org (accessed 3 Jun 2016).

[295] *Intellectual property statistics 5(five) executive summary report* (2013) 3. See http://www.fiveipoffices.org (accessed 4 Jul 2016).

The following diagram (Figure A) illustrates the number of patents filed each year internationally from 2008 until the end of 2012.

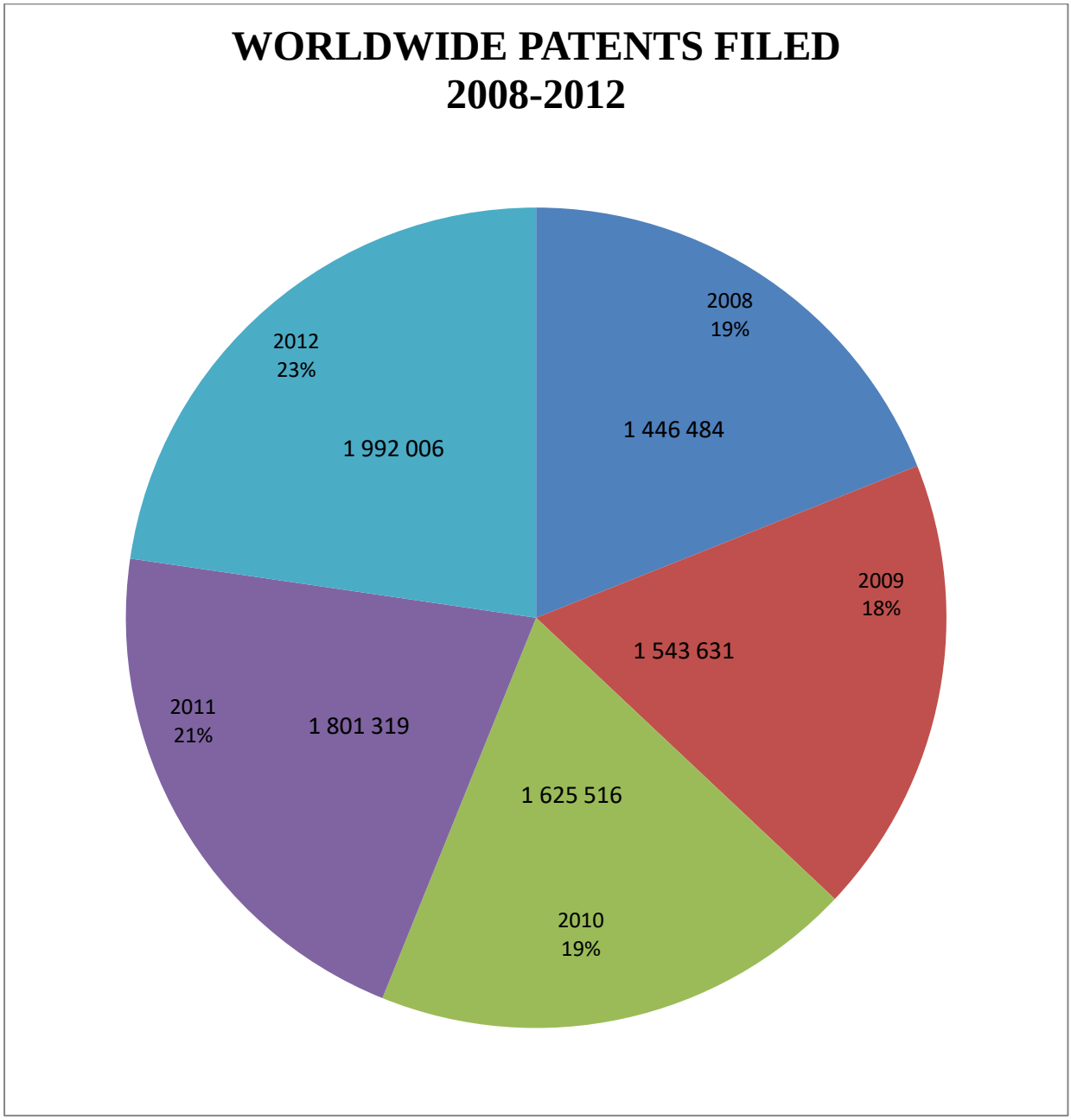

Figure A: Worldwide patents filed 2008-2012

Source: IP5 statistics Report 2013 executive summary

The number of patents filed internationally increased by 11% between 2011 and 2012.[296]

Furthermore, the following diagram (Figure B) illustrates the percentage of patents filed and put into force by five of the largest international IP offices, namely, the Korean Intellectual Property Office, the State Intellectual Property Office of the People's Republic of China, the Japan Patent Office, the European Patent Office and the USA Patent and Trademark Office.

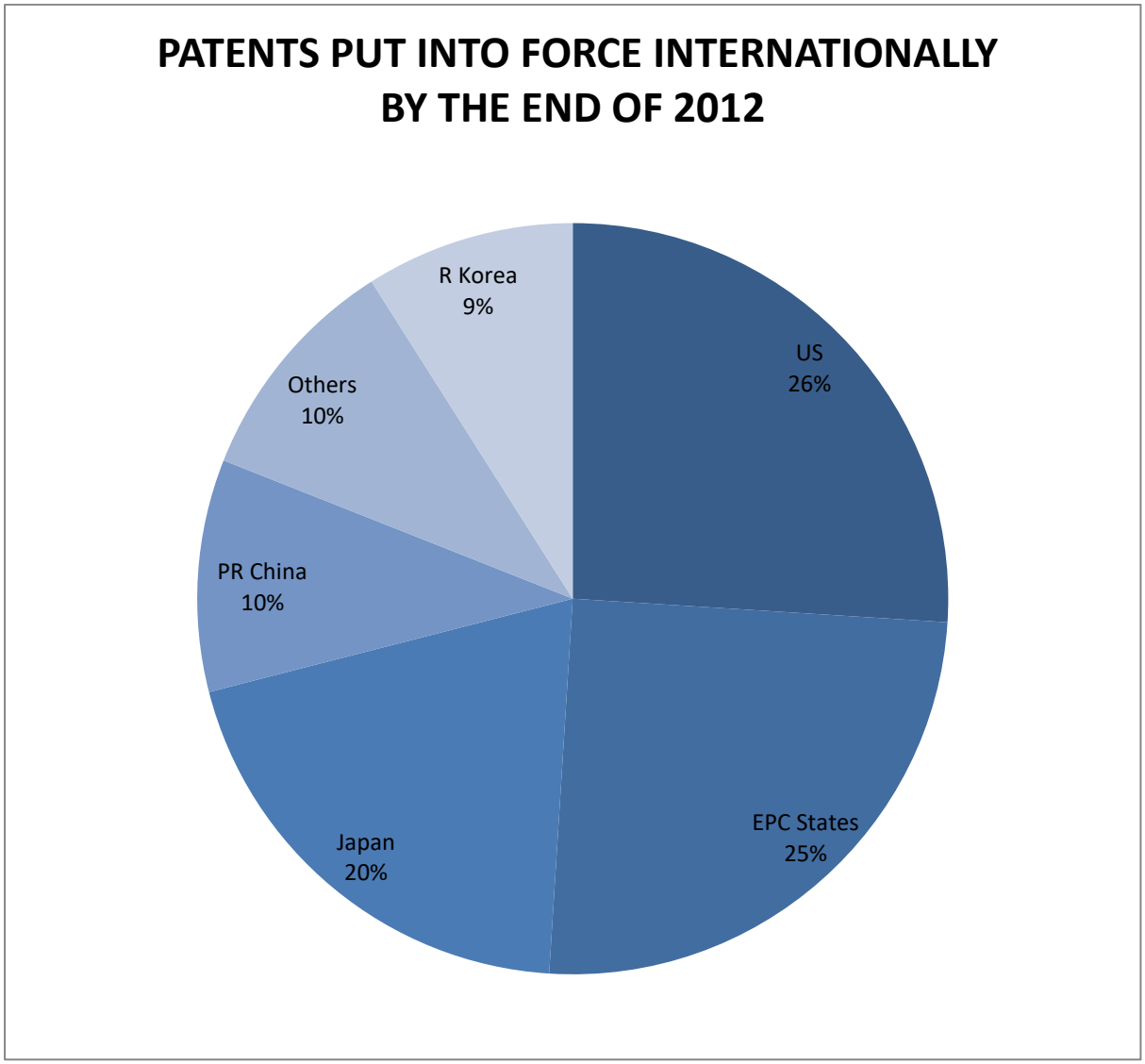

Figure B: Patents put into force internationally by the end of 2012

[296] *Intellectual Property Statistics 5(five) executive summary report* (2013) 3.

Source: This data is derived from the most recent worldwide patent information, available from the WIPO Statistics Database.[297]

The current patent application system, particularly with regard to food and agriculture, creates gaps and tensions between corporate profits and social benefits.[298] The main objective of the patent system should be to promote innovation and transfer knowledge, thereby satisfying the necessary needs of consumers as well as the economic development of the nation. The second objective should be fair compensation to the inventor.[299] It is important to mention that the inventor could not exist without society.[300]

The system mainly focuses on corporate ownership's power over the product and knowledge, which decreases competition and as a result creates monopolies. The degree of competition puts local producers under pressure and discourages further future innovation.[301] This requires a carefully balanced solution focused on both IP protection and promoting local innovation, especially in agriculture, which desperately needs to address the issue of food insecurity.

It might be easy to identify the economic cost and benefits of patents by examining what the impact of the innovation, competition and resources devoted to the implementation and enforcement of patent law is. In practice there is certainly no equalising evidence that patent

[297] *Statistics Patent* (2012). See http://www.wipo.int (accessed 4 Jul 2016).

[298] *New contract between science and society* (1998) 2. See http://www.unesco.org (accessed 3 Jun 2016).

[299] Arup & van Caenegem (2009) 29.

[300] *Ibid.*

[301] M Khor *Intellectual property, competition and development* (2005) 3. See http//www.wipo.int (accessed 29 Jan 2016). Contemporary studies argue that patent law policies should focus on the question of benefit and desirability of scientific and technical progress including not only the competitiveness of the economy, but also the environmental and social implications of technological change.

law benefits society in particular.[302] This does not suggest that we should scrap the patent law from food and agricultural industries, but rather that the system should be revised to offset any misallocation of rights.

Currently patent tax in the USA alone has increased with the continued growth of patent litigation.[303] This study does not to attempt to precisely measure the full social benefit and cost of patent law, but instead tries to give a brief description based on the available studies to illustrate the social cost and benefits of patent law.

The following diagram (Figure C) illustrates that the number of patents filed and being litigated in the USA has risen dramatically. This will help us to understand the gap created in Patent law and its effect in real life.

[302] Kur & Mizaras (2011) 55.

[303] J Bessen & M Meurer *The cost and benefits of patents to innovators* (2008) 4. Taking in to account the risk of litigation, the average public firm outside the chemical and pharmaceutical industries would be better off if patents did not exist. See http://www.patentlyo.com (accessed 29 Jan 2016).

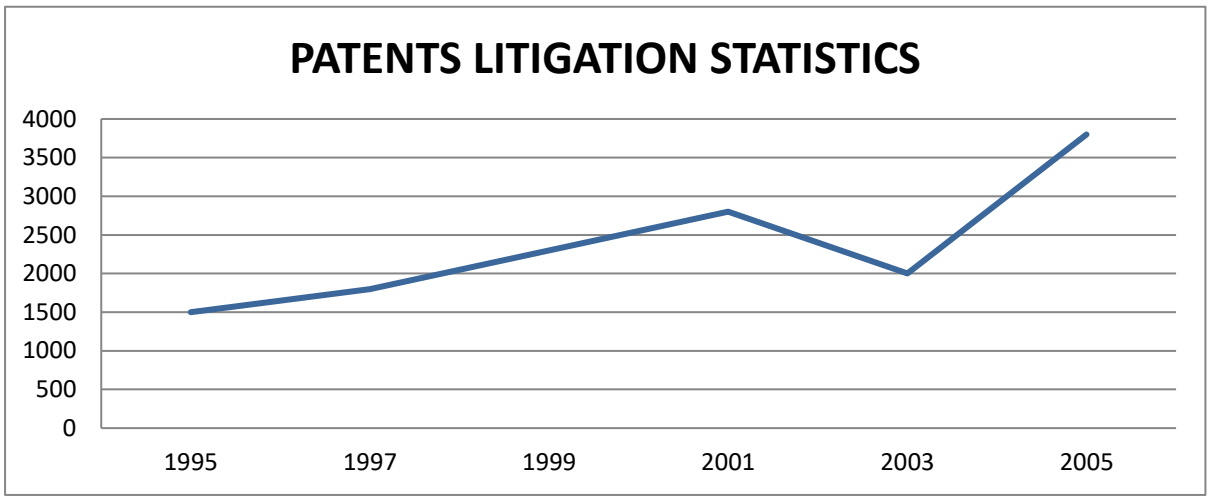

Figure C: Patents litigation statistics (reflecting the number of patent litigations in the USA alone) Source: D Crouch (2010)[304]

The cost of patent litigation indicates that the patent system delivers negative effects, especially in agricultural industries, where local farmers are infringers for utilising the patented seed. Such farmers end up paying damages to the patent right holders.[305] Patent law encourages corporate and wealthy innovators more than small industries, such as local farmers. Local farmers face several challenges in order to obtain patents for their GRs and TK, mainly because the applications for patents are costly and too sophisticated for most farmers to understand.[306]

In general, there is a greater challenge in today's agriculture than has ever been faced in its 13 000 year history.[307] The existing patent requirements that are applied to food and agriculture

[304] D Crouch '*Patent litigation statistics: Number of patents being litigated'* (2008) 1. See http://www.patentlyo.com (accessed 3 Jun 2016).

[305] Rose (2011) 134.

[306] Tansey & Rajotte (2009) 149.

[307] M Haga Executive director of the Global Crop Diversity Trust speaking at a high level seminar held 23 February (2016) at Addis Ababa stating that '… if food security were easy, we would have it by now. The

have failed to comply with basic patent requirements and therefore their application is seen as inappropriate.[308] For example, for ordinary farmers to challenge the prior existence of TK and traditional plant varieties, the burden is on the challenger of the patent and this process is too sophisticated, costly and time consuming for ordinary small-holding or subsistence farmers.[309] Thus, it is very likely true that patent law has a negative incentive for small-scale farmers who are the principal providers of food to local communities.

It cannot be argued that emerging innovation in agriculture increases production.[310] The problem lies in the fact that the distribution of available food on the market is often not accessible for the low income population.[311] This proves that the availability of food does not ensure accessibility to the masses. Increasing innovation in agriculture should focus not only on the profit for the corporation, but also on public interest in the social corporate context. Through patents larger corporations often continue to gain more power and thus *de facto* (not necessarily by legal rights) control the world's food supplies and, by implication, thus have the power to influence food availability to the population.[312]

More broadly, fair patent law should bring a more just benefit to the public when compared to its cost to society. Corporations have positioned a range of strategies to gain increasing control

complexities are all well understood and it is clear that crop diversity is prerequisite for a sustainable food system. Crop diversity can be conserved and shared among the world community but it needs global leadership and strong partnership.'

[308] Rimmer (2007) 50.

[309] *Ibid.*

[310] G Micek *Understanding innovation in emerging economic spaces: Global and local actors, networks and embeddedness* (2016).

[311] *Ibid.*

[312] Holt-Gimenez (2016).

over the food basket and agricultural products in the global context.[313] By its very nature this has food sovereignty implications for a country and can impact on food trade control and biosecurity. Trade and investment law are the defence of choice for these corporations to impose international law.[314] Countries with a high deficit of food production cannot afford to continue to grant strong and broad patents on food to these corporations.

Patent law as it is now, especially in agriculture, is ill-equipped to address food insecurity and continues to impose more restrictions on seeds, which are the core source of food production and supply. In general, IP law should serve as a means of achieving social responsibility and not to be an end in itself. It should be a goal that is pursued only in the right holder's interest to the exclusion of others. It is now more commonly practiced that, in most parts of the world, local farmers are not allowed to replant the seed they bought from the corporations unless they buy more. So in fact they end up being trapped in a cycle of repetitive purchasing of stocks or material that they originally owned. In addition, seeds sold can often not be re-produced. This is one of the indications that patent law is ill-equipped to fairly administer and thus needs reform.

It would be fair to say that restrictions created by patent systems on food and agriculture, in economic terms, might result in lower output and less competition which in the process eradicates social benefits and future hope for more invention through cumulative knowledge.

[313] *Ibid.*

[314] *Ibid.*

This spiral can eventually eliminate and reduce consumer surplus.[315] The broader IP protection of food production, particularly in developing countries and concentrating on the ownership of food, does not invite a benefit to the larger community. This creates resource dislocation in a few hands, with the majority of the people still unable to put food on their tables.

4.3 WORLD TRADE ORGANISATION AND AGRICULTURAL TRADE

The first time the WTO introduced the minimum requirement for IP protection into agriculture it was widely criticised as patent applications on plant varieties are ill-adapted.[316] This is because patents were initially adopted at the Paris Convention in 1883 for the protection of industrial or technical inventions only.[317] It is problematic to apply the same system used for technical inventions to plant varieties, considering the physiological characteristics of plants.[318] For this reason, it is difficult to meet the requirement of novelty on plants.

The agricultural trade battle in the WTO began in Doha, Qatar, in 2001. This negotiation was supposed to be completed by January 2005, but has since been extended indefinitely.[319] In practice, the developing countries have little or no major influence in the decision-making process in the agricultural trade battle in the WTO and their fate is often determined by the

[315] This information draws on an extensive and wide range of readings of the range of possible IP law impact on food and agriculture identified here, further information draws from Moir *What are the costs and benefits of patent systems?* (2008) 1.

[316] Rimmer (2007) 50.

[317] Rimmer (2007).

[318] *Ibid.*

[319] J Clapp *WTO agricultural trade battles and food Aid* (2004) 3. See http//www.acadamia.edu TIPPEC Working paper 04/5 (accessed 10 Feb 2016).

deals brokered between the developed worlds.[320] Most delegates from developing countries come to international negotiations without a clear mandate from their local government and without expertise, and lack objectives to clearly use the negotiation tools effectively to their advantage.[321] Delegations with a clear mandate from their local government with the necessary skill and expertise are more likely able to use the negotiation tools to their advantage.[322]

The TRIPS agreement of the WTO brought the international application of IP law into a single agreement.[323] Article 27 of TRIPS is the most important provision for food security in particular. Most importantly, its concerns are exceptions to the rules.[324] Article 27(3)(b) mandates WTO members to permit patenting of micro-organisms as well as biological processes, but allows members to be excluded from patenting GRs and TK. This has been seen by developing countries as permission to bio-piracy.[325]

The battle in agricultural trade in the international forums between the developing and developed worlds as well as that over subsidised farmers remains unresolved in the TRIPS provisions.[326] The developing countries' national food security program is concerned solely with how to support their farmers and feed their impoverished and chronically hungry people

[320] Blakeney (2009) 2.

[321] https://www.odi.org.

[322] *Ibid.* Countries for trade negotiations, as for other aspects of development, need an effective way to coordinate policy at national level. In international negotiations countries need long-term experience, expertise on the subject and the process is able to identify their objectives clearly and use the negotiation tools effectively.

[323] Secretariat of the CBD (2010) 106.

[324] Blakeney (2009) 14.

[325] http://www.institute of science in society.org.uk.

[326] S Donna *The business of global food* security (2014) 2. See http://www.ft.com (accessed 15 Mar 2016).

in a globalised world.[327] In 2013, the first time in almost 20 years of the battle of agricultural trade at the WTO delegates agreed upon certain ideas.[328] These ideas only delay the unavoidable broader negotiations, the call for reforming the international trading system and the challenges associated with food security, which is as yet unresolved.[329]

More importantly, at the time when IP gained momentum in international trade at the Uruguay round of trade negotiations in 1986, most African countries expressed their displeasure, particularly with the international application of patents and the lack of preferential arrangements in the translation of works to verify novelty.[330] The developing countries preferred that WIPO act as specialised agents and that IP matters be left to the organisation and not be included in trade negotiations.[331]

Agriculture in Africa is threatened by problems from drought or diversion of arable land to cash crops and expansion of urbanisation, but also impracticable agricultural and trade policies which all aggravate food insecurity.[332] The WTO cannot escape from the issue of agriculture, especially the battle in which rich economies over-subsidise their farmers and the developing countries having to deal with poor infrastructure and being unable to support their farmers to contribute to the national food income of the country.[333] The ongoing battle in agricultural trade

[327] *Hunger Statistics* (2015). See http://www.wfp.org (accessed 25 May 2016).

[328] S Donna *The World Trade Organisation takes on food security conundrum* (2014) 1. See http://www.ft.com (accessed 15 Mar 2016).

[329] *Ibid* 2.

[330] Tansey & Rajotte (2008) 50.

[331] *Ibid.*

[332] C Kaufmann & S Heri *Liberalising trade in agriculture and food security—mission impossible?* (2007) vol 40 1039

[333] *Ibid.*

in the WTO has failed poor countries for the last 14 years. There are also ongoing negotiations to achieve a breakthrough in key agricultural trade blocks or agreements.[334] The report suggests that at the 10th WTO Ministerial Conference that was held in Nairobi, Kenya in December 2015, most developing countries were pushing the Doha Development Agenda in the meeting although reports publicly declared the death of the Doha Development Agenda once again.[335]

4.4 WIPO AND AGRICULTURE

The WIPO is an organisation established by treaty as an agent of the UN in 1967.[336] The purpose of the establishment was to administer and promote IP protection globally.[337] The three main activities of the organisation are to:

1. Facilitate the application of the IP rights.
2. Administer patent information.
3. Endorse new treaties in order to harmonise patent rules globally.[338]

The WIPO as an organisation is best equipped to address the IP system in general and to adapt new or improved law where there is technological change, such as biotechnology. The concern in the management of patents, especially in biotechnology, is far from being resolved. In fact,

[334] *Ibid.*

[335] HG Campbell *Reflections on the 10th ministerial conference in Kenya* (2016). http://www.counterpunch.org/ (accessed 11 Feb 2016).

[336] M Jamison 'Patent Harmonisation in Biotechnology: Toward international reconciliation of the gene patent debate' (2015) 703-704 *Chicago Journal of International Law* vol 15 no 2 art 9 (accessed 3 Dec 2016).

[337] *Ibid.*

[338] *Ibid.*

the member states still struggle to agree on the scope of what subject matter may be patentable and it lacks global substantive uniformity in patentability standards.[339]

In 2011, the WIPO convened for the first time in a seminar concerning agriculture.[340] According to its mandate, the WIPO has a major responsibility to play a very important role in IP, which includes creating awareness about how IP promotes invention, social responsibility and knowledge transfer. The aim of the seminar was to find solutions to the world's food shortage and how to adequately feed the ever growing population of the world.[341] The most important issue raised at the seminar was exploring what IP's contribution to agricultural technology and invention would be.[342]

The IP driven or demand-pull mode of agricultural development to increase food production would be one side of the story. There is also a need to have a balanced legal framework tailored to promote the interest of the public as well as the inventor. It is not sufficient to increase food production alone, but also to increase the affordability. The question to ask here is: how should the system work together in harmony to promote food security and create an atmosphere that will feed the world's hungry?

[339] *Ibid.*

[340] *IP is spearhead of agricultural innovation solution to food shortage* (2011). See http//www.ip-watch.org (accessed 9 Feb 2016).

[341] *IP is spearhead of agricultural innovation solution to food shortage* (2011).

[342] *Ibid.*

4.5 THE EFFECT OF BAD PATENTS ON AGRICULTURAL TRADE NEGOTIATIONS

This part of the study will review and provide evidence on how food and agricultural resource patents affect agricultural trade negotiations. It is unfortunate that most international agricultural negotiations are not promising to achieve the goal to end global hunger. For the first time in 1986, the Uruguay round of trade negotiations grouped together developing countries and addressed the range of international trade distorting agricultural policies of their concern, but the negotiations failed.[343]

Patent law is far from complete and patents granted on agricultural invention often overlooked the principal source of invention, which is TK and traditional agricultural resources. The use of IP protection on agricultural resources provides incentives for invention, whereas the concern raised by developing countries is that the novelties of invention, particularly concerning agricultural resources, are often questionable. The cases where the claimed inventions are derived from existing TK and make use of traditional plant varieties, the problem was the lack the certainty of knowing where and to what extent the patent complied with patent requirements.[344] The burden of proving a bad patent and proving the prior existence of TK and traditional plant varieties is on the complainant, and this process requires resources, time and

[343] KA Elliott *Food security in developing countries: Is there a role for the WTO?* (2015) 2. See http://www.egdev.org (accessed 24 Mar 2016).

[344] Tansey & Rajotte (2009) 149.

skills, which most developing countries do not have.[345] As a result of this complex issue of agricultural negotiation, the battle is yet to be resolved and negotiations are still on hold.[346]

Agricultural negotiation has long been a tough and complex issue to tackle. It is easy for the wealthier nations to shape the rules, influence policy makers and trade negotiations to protect their interests; whereas developing countries are side-lined and increasingly frustrated by their inability to use the system with clear objectives to protect their interests in the negotiations.[347] The great imbalance and knowledge gap among nations in international trade and negotiations created pressure particularly for less developed nations. As a result the system prevents most developing countries, especially African countries, from entering the global market and the global market benefits remain among the wealthiest nations.

There are an increasing number of complaints raised by developing countries on the role of IP with regard to their fate when it comes to misappropriation and bio-piracy of the local and indigenous agricultural resources and TK. These resources and knowledge fields are often illegally taken from ordinary farmers and public research institutes and used by foreign operators.[348]

Economists have long been debating IP law and their application in certain sensitive subject matters.[349] For example, the application of IP on biotechnology, but not on GRs and traditional

[345] *Ibid.*

[346] Jamison (2015) 704.

[347] Elliott (2015) 3.

[348] Tansey & Rajotte (2009) 149.

[349] IM Cockburn *The economics of intellectual property: Intellectual property rights and pharmaceuticals challenges and opportunities for economic research* Chapter 5 151. See http://www.wipo.int (accessed 11 Apr

inventions or techniques, puts indigenous people under enormous pressure from both biodiversity loss and the development process.[350] Concerning food security, broad patents on agricultural resources create barriers for further invention, inaccessibility of food by impeding restrictions and lead to millions of small farmers being excluded from economic participation.[351]

Given the stakes, the complexity of the IP system, dishonesty in disclosing the novelty of the invention and ineffective international negotiations, particularly from the perspective of developing countries, create imbalances. The system failed to protect the interests of indigenous people and their TK and GRs, which are freely accessed with no protection available and how equitable IP protection would be if it existed. It is troubling and unfair to continue keeping tight restrictions only on industrial forms of agricultural resources so that the wealthiest nations retain their position and the informal agricultural industries of the poor countries remain uncertain of whether they will be able to secure their next meal.

4.6 CONCLUSION

In the light of the above discussion on the interaction between patent and agriculture and the negotiations towards the reconciliation of patent debates in different international forums, such

2017). In principle IPR could support (and potentially global welfare-maximising) differential pricing across countries that reflect in income and sensitive demand to prices. These price differences may create additional domestic and international controversy. Countries pay high prices and it is unclear whether the system is sustainable in the long run.

[350] Secretarial of the CBD (2010) 108.

[351] C Greenhalgh & M Rogers *The nature and role of intellectual property innovation, intellectual property, and economic growth* (2010) 32-34.

as WIPO and the WTO, it is unlikely to provide a long-term solution. It is thus essential to carefully evaluate putting an equitable form of IP rules in place to protect all-inclusive GRs and associated TK as well to help to end hunger.

In conclusion, the impact of IP on food and agriculture is a growing concern for developing countries, in which disregard of their contribution in agricultural development and lack of protection for their GRs and practice has been compromised. Henceforth, there is a need for new rules tailored to balance the rights of innovators and local, indigenous people as well as consumers. Therefore, this study suggests that there is a need for a carefully sought and balanced solution to move the system forward.

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CHAPTER 5

CHAPTER 5

Global Negotiations and Agreements on Agriculture

5.1 INTRODUCTION

'People of the same trade seldom meet together even for merriment and diversion, but the conversation ends in a conspiracy against the public or some contrivance to raise prices.'[352]

This chapter will investigate the global agreements and negotiations at various international forums, mainly by focusing on those established in agriculture. Therefore, this part of the study will discuss the negotiations on the CBD, the ITPGRFA, the UPOV and the TRIPS agreements.

[352] W Adams & J Brock *Adam Smith goes to Moscow: A Dialogue on radical reform* (1994) 61. Conspiracies are not our only problem. Reports tell of conspiracies to prevent newcomers from entering the market, boycotts of firms that do not belong to the conspiracy and agreements to divide the markets among the conspirators (the monopoly dilemma).

The main focus of this study is to identify the potential weaknesses of international agreements and negotiations categorically in addressing the 'right to food.' Therefore, this study seeks to fill the gap by adopting a holistic approach in addressing food security in the light of regaining balances within IP protection equitably.

5.2 THE CONVENTION ON BIOLOGICAL DIVERSITY (CBD)

In Nairobi in May 1992, the CBD was adopted for the first time and it was later opened for signature at the Earth Summit in Rio de Janeiro in June 1992. The CBD came into effect in 1993 as a result of negotiations in an attempt to create a mechanism through which accessibility should be allowed for the utilisation of GRs and give regard to associated TK, through a system that obliges the sharing of benefits and the transfer of technologies.[353]

The CBD addressed its member states to provide access to their GRs and TK to the user states, on condition that the sharing of benefits, transfer of technologies, and TK must be respected and promoted.[354] The CBD further recognised that plants and GRs belong to the countries in which they are found and the parties have to disclose the component of GRs used from where they originate.[355]

[353] Blakeney (2009) 95.

[354] AE Crocker 'Will plants finally grow in to full patent protection on an international level?' (2003). A look at the history of USA and IP law regarding patent protection for plants and the likely changes after the US Supreme Court's Decision in *JEM Ag Supply v Pioneer Hi-Bred'* (2001). *Drake University Journal of Agricultural Law* 251 8.

[355] *Ibid.*

Reflecting on the unsettling ideals of the CBD, the concern is on the protection of the resources according to IP protection. By its very nature GRs can easily be replicated and moved across transnational boundaries, it is difficult to trace their origins and identify the country of origin.[356] Traditionally, almost all countries in the world and particularly developed countries used 'borrowed' plants or introduced *species pluralis* (spp), for food and agriculture, for example, rice from the USA comprises 219 native and 106 introduced spp, while Bangladeshi rice comprises four native and 229 introduced spp.[357]

There are no countries in the world that are completely self-sufficient for their own food security;[358] all are interdependent of one another.[359] In the same way, all other major staple foods and agricultural products are traditionally shared among nations.[360] The case for identifying the countries of origin of a particular plant and GR has long been considered a daunting task.[361] With new third generation technology platforms whole genome sequencing makes it easier to trace the origins of ssp and follow their pathway of introductions around the globe.[362]

[356] Blakeney (2009) 96.

[357] *Ibid* 95-96. See C. Fowler & T Holdkin 'Plant genetic resources for food and agriculture: Assessing global availability' (2004). *Annual Review of Environmental Resources* 29 10.1-10.37.

[358] Blakeney (2009) 95.

[359] *Ibid.*

[360] *Ibid* 96. See the studies referred to in *System-wide Genetic Resources Programme (SGRP)* (2006). Annotated bibliography addressing the international pedigrees and flows of plant genetic resources for food and agriculture. *IPGRI, Rome.*

[361] Blakeney (2009) 96.

[362] *Current state-of-art of sequencing technologies for plant genomics research* (2012) http://www.ncbi.nlm.nih.gov (accessed 7 Jul 2016). Many next-generation sequencing (NGS) technologies such as Roche/454, Illumina and AB SOLLD have recently become available.

Furthermore, it has also been indicated by various institutions responsible for agricultural research that the origin of ssp has been misappropriated and exploited by private entities as a basis for IP application on GRs.[363] For example, in 1998, genetic stock of *Peavine* and *Lentil,* obtained from a gene bank at the CGIAR base, showed that the GRs initially originated from Aleppo, Syria, but that the application was brought forward by Australia.[364] The application for the PBRs was thus withdrawn.[365]

The provision of the CBD is in many respects vague and various practical studies have shown that the attempt at putting the provision of the Convention into practice is a challenge. The provision of the Convention seems superficial in its implementation as compliance and enforcement are subject to the parties' mutually agreed terms.[366] There is nothing to stop the unilateral expropriation other than the positive obligation of the parties, as prescribed by the provision. As a result, the Convention is still under scrutiny and continues to change as countries undertake to implement it in their national law. New issues arise and thus its development is still ongoing.[367]

The scope of the requirement of the CBD has not yet been agreed on by member states of the Convention.[368] The key question to be answered here is whether or not the Convention results

[363] For an analysis of claims of unauthorised access and misappropriation of genetic resources and associated traditional knowledge (2005) see http://www.UNEP/CBD/WG-ABS/$/INF/6 (accessed 14 Jun 2016).

[364] Blakeney (2009) 98.

[365] *Ibid.*

[366] *Ibid* 95-103.

[367] Tansey & Rajotte (2009) 99.

[368] Desai (2015).

in legal uncertainty as it lacks meaningful substantive examination of its application in order to achieve its goal.

In an effort to bring clarity to the provision, the Nagoya Protocol was adopted in 2010. The protocol promotes access to GRs and the fair and equitable sharing of benefits (ABS) arising from the utilisation of GRs and to advance the implementation of the provision.[369]

The term ABS in the CBD indicates that distributive justice among users and providers of GRs and associated TK is supposed to be applicable and implemented to achieve its goal.[370] The CBD formula generally indicates a balanced right between users and providers in relation to the distribution of resources which are closely related to sustainable development.[371] The ABS-related intergovernmental obligations under the CBD reflect a concept of distributive justice. The CBD introduced the sovereign right entitlement over GRs and created a bilateral contractual instrument for the management of ABS, with the aim to achieve cooperation, equity, fairness and justice, but unfortunately, the implementation of this principle proves to be difficult in practice.[372]

ABS agreements were negotiated as part of environmental issues under the CBD in order to maintain the conservation of biological diversity and to ensure that benefits are shared with the providers from the utilisation of GRs to help providers continue to conserve and recover their investment on conservation.[373] No significant progress has to date been made with regard to

[369] *Access and benefit sharing (ABS)* (2011). See https://www.cbd.int (accessed 14 Feb 2016).

[370] *Access and benefit sharing (ABS)* (2011).

[371] *Ibid*.

[372] Kamau & Winter (2009) 15.

[373] *Ibid* 4.

the adoption of the Convention that might have any impact on the benefits received from ABS and used to undertake conservation.[374]

Despite the provisions provided in the framework for the implementation of ABS agreements for the utilisation of GRs and associated TK between the user and the provider, they are not yet seen as fully operational. The institutionalised framework of the Nagoya Protocol established ABS agreement does not give a clear instruction to ensure legal certainty to achieve its own objectives.[375]

The CBD regime can be used as the basis upon which to establish national frameworks so as to facilitate bilateral contractual agreements negotiated between parties.[376] The corresponding provisions regulating ABS are directed to the contracting parties and their implementation is explicitly subject to national legislation.[377]

Recently an effort was made to address the challenge in the implementation of the Nagoya Protocol. On 6 May 2016, the subsidiary body on the implementation of the CBD held a meeting for the first time in Montreal, Canada.[378] The purpose of the meeting was for parties of the Convention and its protocol to consider the recommendation made by the body on the implementation on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits

[374] *Ibid* 5.

[375] JC Cabrera et al *Overview of national and regional measures on access and benefit sharing challenges and opportunities in implementing the Nagoya Protocol,* 3rd ed (2014) 22-25.

[376] Biber-Klemm & Cottier (2008) 295.

[377] *Ibid.*

[378] *United Nations decade on biodiversity* (2016). See https://www.cbd.int (accessed 14 Feb 2016).

Arising from their utilisation, as the way and means to enhance it to achieve its initial intended target.[379]

The recommendation focused on mainstreaming measures, capacity building and technical and scientific cooperation.[380] The recommendation also provided a review of progress on a globally agreed plan for halting biodiversity loss at regional and national level, a strategic plan on the Cartagena Protocol on biosafety, the Nagoya Protocol establishing institutional structures and legislative tools in force and operational activities subject to national law, and ways to strengthen collaborations among the biodiversity related conventions and many more.[381] The meeting of the parties on the CBD and Nagoya Protocol were scheduled to take place in Cancun, Mexico from 4 to 17 December 2016 for the consideration of the recommendation.[382]

It is thus crucial to carefully assess the recommendation in order to alleviate the legal uncertainty of the existing systems by incorporating the appropriate procedures to follow and the enforcement mechanism, rather than relying on parties' transparency to give effect to the provision, where there is inequality of negotiating power that exists between parties.

[379] https://www.cbd.int (2016).

[380] *Ibid.*

[381] Ibid.

[382] *Ibid.*

5.3 THE INTERNATIONAL TREATY ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE (ITPGRFA)

The ITPGRFA was established in 2001 with the aim of forming a global response to encourage the conservation of plant GRs and to protect farmer's rights to access and have fair and equitable sharing of benefits arising from the utilisation of the resources.[383] This aim focused on the very reason to advance the recognition of the right to food.[384]

Furthermore, the instrument was fashioned to encourage the adoption of national policies, legal instruments and mechanisms to avoid the destruction of GRs available around the globe.[385] The world today acquires an estimated 150 species of GRs although only 12 of them are made available for 80% of the food uses globally.[386] The empirical study of the FAO in 2010, in its second state of the world's plant GRs for food and agriculture report, shows that 75% of crop diversity was lost over a 100-year period (1900 to 2000).[387] The latest first-hand study of the world's plant GRs for food and agriculture shows that as much as 22% of the wild relatives of

[383] *International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)* (2011). See *http*://www.fao.org (accessed 12 Apr 2016).

[384] *Ibid.*

[385] ER Gold & BM Knoppers *Biotechnology IP and ethics* (2009) 254. Unlike the CBD, ITPGRFA is a treaty which has the characteristic of being multilateral in nature. There are no bilateral agreements between the user and the provider as in the CBD. It is a multilateral agreement and the benefit shared for the utilisation of the GRs for commercialisation purposes is determined by the governing body of the treaty and how benefit will be shared.

[386] *Conservation and sustainable use of plant genetic resources: A question of global food security governance: How does it relate to the realization of the right to food?* (2013). See http://www.fao.org (accessed 12 Apr 2016).

[387] *Crop biodiversity: Use it or lose it.* (2010). See http://www.fao.org (accessed 14 Apr 2016).

important food crops, such as peanut, potato and beans, will disappear by 2055 because of climate change, unless we start conserving them immediately.[388]

The need for a system capitalising on the public good based on an equitable regulatory arrangement in food and agriculture is fundamental to address the question of the sustainable use of plant GRs as a corrector for the realisation of the right to food.

The ITPGRFA was fashioned as a general structure for the sustainable use and conservation of plant GRs for food and agriculture.[389] Surprisingly, it introduced a plant GR pool to lower the deal rate for conservation, research, breeding and training and also for benefit sharing from economical gain derived from the utilisation of the resources.[390] This agreement unlike others, concentrates on the unfolding and upholding of commons.

The ITPGRFA is the result of the emerging IP driven agriculture and the CBD form of the sovereign right over resources.[391] Unlike the CBD, ITPGRFA ABS agreements for the utilisation of the resources have a different approach for accessing the resource and instead it suggests benefits to the countries, while exercising their sovereignty.[392] Thus, the ITPGRFA

[388] *Endangered foods due to climate change* (2015). See http://www.stepin2mygreenworld.com (accessed 14 Apr 2016).

[389] Tansey & Rajotte (2009) 115.

[390] Tansey & Rajotte (2009) 115.

[391] International Union for Conservation of Nature (IUCN). *Intercessional Workshop on Marine Genetic Resources* (2013) 24-25. United Nations General Assembly Ad Hoc Open-ended Informal Working Group to study issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction.

[392] *Ibid.*

promotes the principle of giving free access to the users of their resources.[393] This treaty prohibits the party who accessed the resources from other jurisdictions to apply for IP protection of such resource while maintaining commons to share with others.[394]

5.4 THE INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS (UPOV)

The UPOV was established in 1961 with the purpose of protecting breeders' rights to plant varieties. Later the Convention was modified several times, namely in 1972, 1978 and 1991.[395] The purpose of the amendments was to ensure that member states recognise and protect the discovery of new plant varieties by breeders.[396] The amendments further mentioned that the new plant varieties should satisfy the following criteria in order to become eligible for protection:[397]

1. Distinct (the variety must bear unquestionable characteristics different from all others)
2. Homogenous (the seedlings of a propagate must have uniform composition)
3. Stable (the composition of the new plant varieties must be steadily the same after repeated breeding).

The UPOV focuses on a *sui generis* form of IP protection enabling plant breeders to provide international protection, with the aim of encouraging breeders to develop new varieties of

[393] International Union for Conservation of Nature (IUCN) (2013).

[394] *Ibid.*

[395] United Nations Environment Program *Training Manual: International Environmental Law* (2006) 207.

[396] United Nations Environment Program *Training manual on international environmental law* (2006).

[397] *Ibid.*

plants.[398] The Convention established a specific system of IP tailored to protect the process of plant breeding.[399] This right is similar to patent, granting breeders exclusive rights to plant varieties deemed newly discovered.[400]

In conclusion the UPOV intended to prevent any possible misappropriation at the expense of breeders through the introduction of, for instance, genetic engineering of new characteristics. However, the Convention left the option open to prohibit double protection for a given variety.[401] The European Community directive allows the concurrent protection of a plant variety by breeder's rights and patent.[402] Patent protection, unlike the UPOV, covers genes and the process of the variety.[403] The UPOV expresses its opposition to the mandatory disclosure of the origin of plant and GRs as a condition in the CBD.[404]

The mixed and complex existing international rules that govern agriculture deepen the loss of biodiversity and TK, which are the integral components to end hunger. The danger is that the alienation of the protection of GRs and TK could be irreversible. There is thus a need to find a new approach which enables the harmonising of both tradition and technology inventions to ensure sustainable development.

[398] http://www.upov.int (2005).

[399] *Ibid.*

[400] Tansey & Rajotte (2006) 32.

[401] Lightbourne (2009) 44-48.

[402] *Ibid.*

[403] Lightbourne (2009).

[404] *Ibid* 150.

5.5 PLANT BREEDER'S RIGHTS

Plant breeding is the art and science of selecting plants with desirable characteristics for breeding, using modern term select molecular techniques.[405] This has been practiced for roughly 10 000 years by traditional growers and farmers.[406] At present, breeding is often overtaken by professional breeders employed by institutions and corporations. Various laws are therefore tailored and still emerge to specifically protect industrial breeders' rights over traditional farmers and growers.

The UPOV the first time introduced breeders' rights in 1961.[407] Even though, the Convention did not introduce patent within its structure, it has a similar protection by providing incentives to the private sector to engage in commercial breeding.[408] The difference between patent and the UPOV is that patent novelty criteria require that the invention did not exist previously, whereas the UPOV requires the new variety not to have previously been commercialised.[409]

PBRs, also known as Plant Variety Rights (PVP), are granted to the breeder of a new variety of plant that gives the breeder exclusive control over the propagating material.[410] In 1957 for the first time the French government invited 12 European countries to discuss the possibility

[405] A Hallauer 'Evolution of plant Breeding' (2011) 197; *Crop breeding and applied biotechnology* 11:197-206. See http://www.scielo.br (accessed 21 Feb 2017).

[406] Lightbourne (2009) 3.

[407] P Cullet *The UPOV* (2003). See http://www.ielrc.org (accessed 13 Feb 2017).

[408] Biber-Klemm et al (2006) 81-83. See http://www.ielrc.org (accessed 13 Feb 2017).

[409] *Ibid*.

[410] Biber-Klemm et al (2006).

of drafting an international convention to provide protection to new breeds of plants and by 1961 the first draft of UPOV had come into effect.[411]

Currently only 22 African countries are signatories to the UPOV Convention, for example from Southern Africa only South Africa and Tanzania are signatories to the Convention.[412] It is important to mention that the WTO compels its members to comply with Article 27(3)(b). The provision explicitly says that members must provide an effective *sui generis* system or patent or both for the protection of plant variety.[413]

Although most African countries are new to protecting plant varieties, they prefer to use plant breeders' rights over patent. Currently, as part of WTO member states obligation 27 African countries, including South Africa, customise their own desired plant breeder's rights law to maximise the protection of domestic plant breeders' rights.[414]

South Africa has been an active member of the UPOV since 1977 and adopted the 1961 version of the UPOV and in 1981 adopted the amended version of the UPOV 1978; later in 1997 South Africa adopted the new version of the UPOV of 1991. Furthermore, according to the Department of Agriculture, Forestry and Fishery (DAFF) South Africa annually contributed the membership fee of R680 532.63 to the UPOV and actively participated in the Convention's

[411] S Sterckx & J Cockbain *Exclusions from patentability: How far has the European patent office eroded boundaries?* (2012) 26-37.

[412] *Kenya accedes to the 1991 Act of the UPOV Convention* (2016). See http://www.spoor.com (accessed 21 Feb 2017).

[413] W Lesser &S Lynch 'Plant breeders' rights: An introduction' (2007)382. See http://wwwiphandbook.org *IP hand book of best practices* (2007) (accessed 21 Feb 2017).

[414] http://www.spoor.com (accessed 21 Feb 2017).

technical working parties.[415] The South African Plant Breeders' Rights Act 1976, as amended by Plant Breeders' Rights Act 1996, is aligned with the 1978 and 1991 UPOV Convention principles.

In 2013 the South African DAFF sought to amend the existing PBRs Act 1976. Accordingly, in 2015 the proposed PBR and Plant Improvement Bills were opened for public comment.[416] Later, in November 2016 the Plant Improvement Bill B8B 2015, the Plant Breeders' Rights Bill B11A 2015 and Plant Improvement Bill B8A 2015 were published as agreed to by the portfolio committee. The amended Act provides in more general and broader terms that 'plant breeders' rights relating to varieties of certain kinds of plants may be granted and registered for the requirement which have to be complied with for the granting of such rights, for the protection of such rights and the granting of licenses in respect of the exercise thereof and to provide for incidental matters.' Furthermore, the Bill provides an extension for the Minster to make regulations on application and limits farmer's privilege. It also stipulates that the infringement of PBRs is regarded as a criminal offence punishable by a fine or imprisonment for a period not exceeding 10 years.

It is important to note that the PBRs in nature are not absolute, since the right granted is on the discretion of the official based on the information obtained and it might transpire later that new information could change the whole *status quo*. The worry here is that PBRs principally are a private right and the enforcement of such rights should be brought in terms of civil procedure and not criminal prosecution. There is no guaranty of the possibility that contrary information

[415] M Semenya *UPOV's Plant Improvement and PBRs Bill [B8 &11-2—15) redrafting* (2016). See http://www.pmg.org.za Committee-Meeting/22514 (accessed 20 Feb 2017).

[416] *Ibid.*

might appear which was not disclosed to the registrar earlier. As a result the right granted could be invalid and the conviction was based on the invalid rights. This creates legal uncertainty and must be addressed.

Countries that are party to the WTO are obliged to select an effective *sui generis* system if they choose not to use patent for plant protection.[417] Accordingly, they may choose the UPOV or another *sui generis* system over patent.[418] The UPOV is a global system similar to IP, informally known as PBRs. Although the UPOV did not introduce patent in its framework, the 1991 version of the UPOV allows dual protection both to PBRs and patent at the same time.[419]

In order to obtain protection for new plant varieties, breeders need to file individual applications with the authority of UPOV.[420] Later the Convention was revised several times, including in 1978 and 1991.[421] The 1978 provision of the Convention allows farmers to re-use propagating material from a previous year's harvest to freely exchange seeds of protected varieties with other farmers. The 1991 Convention restricted those farmers' privilege and granted exclusive rights to harvested material of the patentee and eliminates the distinction between discovery and development of varieties.[422]

The UPOV Act is silent in addressing farmer seed savings. As a result, farmers were unable to save seeds they buy with specific characters to replant for the next harvest and to develop a

[417] Lesser & Lynch (2007) 381.

[418] *Ibid.*

[419] Lesser & Lynch (2007) 381.

[420] *UPOV* (2011). See http://www.upov.int (accessed 2 Feb 2017).

[421] *Ibid.*

[422] Biber-Klemm et al (2006) 81-83.

very distinctive seed as they desired,[423] if the plant variety rights were granted under UPOV or patent law.

Despite the current dominance of patented plant and seed, farmers once had a great deal of control over plant varieties to select and propagate, which is no longer the case. The argument is that the existing law neglects traditional invention without providing protection over the emerging invention. This hinders the traditional practice and disempowers the indigenous community, which is a great tragedy for today's civilisation.

The critical point of UPOV for most developing countries is that the provisions more likely serve the needs of mechanised and large scale agriculture than small-scale farmers. The only rational reason behind the developing countries becoming members of UPOV is to fulfill their obligation under TRIPS Article 27(3)(b), but is detrimental for member states to adopt a *sui generis* system.[424] As a result some African countries adopt local legal frameworks to local circumstances and needs, rather than have UPOV provide them for the protection of rights of local communities, farmers and breeders.[425]

[423] JP Oczek 'In the aftermath of "terminator" technology controversy: intellectual property protections for genetically engineered seeds and the right to save and replant seed' (2000) *Boston College Law Review* vol 41 iss 3 no 3 (2000) 627, 647. See http://www.lawdigitalcommons.bc.edu (accessed 27 Feb 2017).

[424] Oczek (2000).

[425] *Ibid.*

5.6 THE ONGOING DISCUSSIONS ON THE AGREEMENTS ON TRADE-RELATED ASPECTS OF IP RIGHTS REVIEWED IN ARTICLE 27(3)(b)

One of the most divisive provisions of the TRIPS agreement and of great meaning for agriculture, biodiversity and food is Article 27(3)(b), which provides protection to plant varieties, either by patent or any other available harmonisation of protection in order to comply with the provisions of the agreement.[426] Although Article 8 of the TRIPS agreement on the one hand stresses that member states must adopt a mechanism to protect public health and nutrition, Article 27 of the TRIPS agreement, on the other hand places an obligation on the member states to protect plant varieties.[427] In case of conflict with Article 27, the agreement clearly recommends that Article 27(3)(b) is supreme over the others and that Article 27(3)(b) will prevail.[428]

Many developing countries view IPR on plant varieties as a policy that seems to serve only the interests of corporations at the expense of the small local agricultural sectors.[429] These regulations do not give the autonomous countries the option to choose whether or not the regime would best benefit their social needs, economic and technological development. Countries who are members of the WTO, that choose not to provide protection for plant varieties under TRIPS, are obliged to provide alternative law to provide protection for plant varieties.[430]

[426] Venson & Santaniello (2004) 110.

[427] Blakeney (2009) 87.

[428] Blakeney (2009) 87.

[429] Venson & Santaniello (2004).

[430] *Plant variety rights and plant patents-bios.* See http://www.bios.net (accessed 30 May 2016).

A recent study shows that the obligation of developing countries to implement TRIPS cost developing countries $60 billion every year.[431] It is believed that the TRIPS agreement is a bad deal to developing countries due to the cost compared to the exchange offer to developing countries of market access in certain areas, such as agriculture, textiles and clothing.[432]

The developing countries have long been calling for a review of Article 27(3)(b) of TRIPS. The provision has no clear direction on how to categorise patentable resources which may and may not be excluded from patenting.[433] Therefore, in their post Doha negotiations concerning the review of the provisions that mainly focused on the procedural issues, the new challenges for developing countries created new phenomena. It not only focused on the review itself, but it also expanded to the relations with the CBD and the protection of TK and GRs, which led to the raising of fundamental questions.[434]

The creation of a framework for the protection of TK and GRs is far from over as the current IP protection framework is designed solely for products of industrialised nations. Unlike WIPO, the WTO has a tendency to lead to the political recognition of the validity of some reviews and demands made by many developing countries that are rich in TK.[435]

[431] Khor (2005).

[432] *Ibid.* World Bank project experience indicates that it will cost developing countries $150 million to get up to speed on three new WTO areas such as IPRS, sanitation and phytosanitary measures and custom valuation. This amount is more than a full year's development budget in many LDCs.

[433] PK Yu *Intellectual property and information wealth: Issues and practices in the digital age* (2007) 46 vol 2.

[434] *Ibid.*

[435] *Ibid*.

5.7 CONCLUSION

The discussion above covers the fact that African countries do not yet fully comprehend the restraint and depth of the application of conventions and treaties and the obligations that are imposed on them. Although African countries are rich in biodiversity and traditional agricultural invention, they are yet to be recognised for their economic value and have not been receiving great benefits to support their economies.

The concern about the failure to protect GRs and associated TK at the same level as biotechnology is far from obvious and raises fundamental questions surrounding the moral and ethical justification of the way current IP law personalised itself and aims to protect and promote only industrial products.

The appropriate starting point for developing countries in devising a new approach and alternative proposal, which can promote the transformation of GRs and associated TK into industrial and social inventions to gain equitable protection, must be identified. A wide-ranging knowledge gap and lack of investment in IP has so far restricted them in terms of their global economic participation. Skills to assist in IP negotiations and ways of finding alternative strategies to protect traditional invention and GRs are needed by African countries.

In conclusion, the review of international conventions and treaties governing food and agriculture, including IP law, is required to avoid over-exploitation and further degradation of plant GRs and associated TK and to address the question of the sustainable international food system by rectifying the error in the system for the realisation of the right to food.

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CHAPTER 6

CHAPTER 6

The Implementation of Various International Treaties

6.1 INTRODUCTION

The previous chapters have sought to establish the current status of various international instruments and negotiations, mainly in agriculture and identify the potential weaknesses of these instruments and negotiations in addressing the sustainable use of plant and GRs. It further examined the interdependence of trade, agriculture, IP and food security.

This chapter will further analyse the scope of the international treaties and conventions governing food and agriculture and their effectiveness to address the legal and political settings of international negotiations and adoption of instruments.

In order to provide a complete view of the existing international instruments governing food and agriculture and its effects on the global food security, it is essential to look at their historical background and establish reasonable certainty of the implementation of the instruments in all jurisdictions.

The existing system constrains the operation of various rules as sought, through overlapping and lack of procedural reasonableness of implementation. The gap created in the existing conventions creates legal uncertainty and is unable to end the vicious cycle of food insecurity on the globe.

The mere creation of instruments is not sufficient if they are not effective in mitigating the issue at hand. It is argued that if the law failed to bring order and legal certainty, perhaps it is time to change it.

It is not clear how the existing treaties and conventions governing food and agriculture might be improved on in a meaningful way. Thus, the study will proceed to examine the effectiveness of existing instruments in practice to assist in deciding on the way forward.

6.2 BACKGROUND AND IMPLEMENTATION OF THE FAO INTERNATIONAL TREATY ON PLANT AND GENETIC RESOURCES

Food is a common concern for all mankind; it is certainly a greater problem when we lack access. The key issue here is the global communities' mutual dependence on others for food and agriculture. It is natural to require an international binding instrument for the peaceful flow of food and agricultural products from one place to the other. As a result, the FAO was

established in 1945, in Quebec, Canada.[436] The conference presented a widely held concern to the international community of states gathered for a common cause to solve the difficulty faced in the global food and agriculture system.[437]

The FAO is the primary international intergovernmental organisation dealing with food and agriculture. The integral objective of the FAO was to create international rules that govern the conservation and utilisation of global plant and GRs for food and agriculture.[438] In addition, in 1974 the FAO technical group for international agricultural research was formed to create a global network of gene banks to store and safeguard *ex situ* the main varieties of food for conservation.[439]

A concern was raised at the FAO, largely by developing countries, for failure to protect the GRs and information entrusted to the FAO's gene bank, which had been misused and abused by commercial corporates. Later, in 1993, there was a call for the FAO's international treaty to be modified to harmonise with the CBD, particularly on the issue of ABS agreements for the utilisation of GRs and the implementation of farmers' rights.[440]

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[436] FAO *corporate document repository.* See http://www.fao.org (accessed 12 Jul 2016).

[437] *Ibid.* David Lubin, a Polish-born American citizen who had achieved considerable success as a merchant in California, became concerned over the plight of farmers during the depression of the 1880s and 1890s, which had also created difficulties for him in his own farming enterprises. Setting out to develop some mechanism at international level for improving the farmers' lot, and through single-mindedness and persistence, he persuaded Ministers in several countries to heed his ideas, and despite many obstacles an organisation along the lines he had in mind was created in 1905: the International Institute of Agriculture (IIA). This first international intergovernmental organisation to deal with problems of agriculture generally functioned within the limitations of its mandate, without serious interruption until World War II, after which its assets were absorbed by the FAO. A major asset was the library, which is now housed in the FAO as part of the David Lubin Memorial Library.

[438] Chiarolla (2011) 7.

[439] A Gillespie *Conservation biodiversity and international law* (2011) 522.

[440] Lightbourne (2009) 146.

In 1994, the FAO took ownership of internationally collected varieties of genes.[441] Nations of the world accessed and benefited from the international gene bank collection for the conservation of GRs without limitations to satisfy their national needs for food.[442]

Further, in 1996, during the 4th International Technical Conference on Plant Genetic Resources, the Leipzig Declaration on conservation and sustainable utilisation of plant GRs for food and agriculture was adopted.[443] The intention of the declaration was to revise the IU and to contribute to achieve the objective and facilitate the implementation of the CBD and farmers' rights.[444] Some of the provisions proposed for revision at the 4th International Technical Conference on Plant GRs, are vital and some are referred to for the purpose of this discussion, for example:

Section 4: … we acknowledge the roles played by generation of men and women farmers and plant breeders, and by indigenous and local communities, in conserving and improving Plant Genetic Resources.

According to the FAO the provision for the legal status of plant GRs' ownership is not clear, other than the recognition of the contribution made by nations and local communities in conserving and improving plant GRs as stated in the provision.

[441] *Ibid.*

[442] FAO, *First Edition – Introduction to the International Treaty on Plant Genetic Resources for Food and Agriculture* (2011). See http://www.planttreaty.org (accessed 31 Oct 2016).

[443] FAO *The* 4th *International Technical Conference on Plant Genetic Resources* (1996). See http://www.fao.org (accessed 11 Jul 2016).

[444] *Ibid.*

Despite the intention by member states to sign an international binding instrument, implementation remains unresolved.[445] The FAO intended to secure provisions to facilitate access to plants and GRs within the multilateral system under the umbrella of the prerogative of the FAO.

This is one of the inherent weaknesses identified in this provision: the failure to safeguard the information, plant and GRs entrusted to the organisation from being misused and abused for uses other than envisaged in the provisions.

In addition, Article 7(1)(a) of the FAO further stresses the international network of plants, GRs and related information that are collected and to be kept in the gene bank for the benefit of international communities.[446] The CBD in contrast focuses on linking access with benefit sharing for the utilisation of plant and GRs for commercial purposes. This approach has frequently been seen by developed countries as divisive. Member states from the developed world mostly view this approach as hindering compliance with the requirement of disclosure of origin.[447]

In closing, the innate fault of the international instruments governing agriculture is the interpretation and realisation of the right to food and farmers' local and indigenous rights that are not sufficiently observed as was discussed above. Without a stable and strong international commitment and focus on effective internationally binding instruments, agriculture continues

[445] Lightbourne (2009) 146.

[446] Chiarolla (2011) 124-125.

[447] Chiarolla (2011) 124-125.

to suffer and the Convention is unable to achieve its ultimate objectives namely to safeguard the erosion of biodiversity and promote global food security.

6.3 THE IMPLEMENTATION OF THE CONVENTION ON BIOLOGICAL DIVERSITY

The CBD is well-known to promote international cooperation to safeguard biodiversity.[448] The establishment of the Convention affirms the sovereign rights of countries over natural resources.[449] The battle in the negotiations specifically relies on the relationship between IP rights and access to GRs.[450]

According to the provision it is the collective responsibility of the international community to safeguard biodiversity.[451] Countries that are rich in GRs and those who have less are argumentative on this particular issue.[452]

The Convention further provides no indication on how to harmonise the applicability of IP rights and sovereign rights. As a result the positive objective of the Convention over many areas has become unachievable. It is important to evaluate the complicated interactions and dynamics between IP rights and sovereign rights over natural resources in order to find a realistic and workable framework.

[448] *Living in harmony with nature: Convention on Biological Diversity* (2011). See http://www.cbd.int (accessed 31 Oct 2016).

[449] Chiarolla (2011) 11-13.

[450] Blakeney (2009) 102-103.

[451] F McConnell *The biodiversity convention: A negotiating history* (1996).

[452] M. Chandler 'The biodiversity convention: Selected issues of interest to the international lawyer', *Colorado Journal of International Environmental Law and Policy* vol 4(1) (1993) 141-161. See http://www.ecolex.org (accessed 4 Oct 2016).

The implementation of the Convention in practice depends on the detrimental actions of the member states in complying with the provision.[453] So far there has been little attempt to put the Convention into practice, partly because of a lack of transparency and commitment equally by member states. According to the Convention there are no clearer guidelines and binding obligations on member states than that which the Convention offers in its goals and guidelines.[454]

Article 1 of the CBD provides that the country or custodian of the plant and GRs gives access to the user in return for fair and equitable benefit sharing for the utilisation of the GRs.[455] The application of the Convention depends on the parties, subject to the national legislation, priorities of parties and the resources available.[456] As a result, in 2010, the Nagoya Protocol, which came into effect in 2014, was established to bring about legal certainty and transparency.[457]

Despite all international efforts to reduce food insecurity and safeguard biodiversity, food remains the greatest social problem of the world. There is a need to have a structure to link institutions to cooperate and coordinate activities for the effective implementation of the Convention. It is also essential to adopt a clear set of rules to prevent further biodiversity loss and increase food security.

[453] Blakeney (2009) 103.

[454] *Chapter 2 The Convention on Biological Diversity* (2002). See http://www.cbd.int (accessed 31 Oct 2016).

[455] *Nagoya Protocol on Access and Benefit-sharing* (2014). See http://www.cbd.int (accessed 14 Jun 2016).

[456] Tansey & Rajotte (2009) 97.

[457] *About the Nagoya Protocol* (2014). See http://www.cbd.int (accessed 14 Jun 2016).

The various barriers to safeguarding biodiversity at every level and endangering food security identify the need for a unifying commitment not only from team players, but also individuals that believe interdisciplinary cooperation is vital. The negotiations on ABS agreements are still ongoing; countries' ability to implement the newly amended ABS legislative and administrative measures is still problematic for some member states.[458]

The other barrier affecting implementation is that the principle of the Convention does not adequately address benefit sharing where the resources are used outside the jurisdiction of the country of origin.[459] As a result, there is still room to manoeuvre and arrangement of power between parties and a risk of misappropriation where there is an absence of a competent authority to direct parties in their administration of biodiversity.[460]

In conclusion, beside the creation of the Nagoya Protocol and amendment of ABS, the conventions are still evolving and need precise firm binding norms. It is also equally important for the effective implementation of the Convention to improve transparency within every jurisdiction. Transparency is one of the elements missing in most multinational systems hindering the implementation and procedural effectiveness as in the Convention. It could be used in increasing compliance and could also increase the accountability and responsiveness of governance. This can be done only if the Convention is adopted with a firmer and clearer set legal framework with multinational measures of transparency that would bring greater legal certainty than its current position.

[458] *Access and benefit-sharing of genetic resources* (2016). See http://www.idlo.int (accessed 1 Nov 2016).

[459] Blakeney (2009) 108.

[460] *Ibid.*

6.4 THE IMPLEMENTATION OF THE INTERNATIONAL TREATY ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

The ITPGRFA was adopted out of a concern for the rising inappropriate private and sovereign control over plant GRs for food and agriculture.[461] The ITPGRFA differs from the CBD in its application of the obligation of countries to give access to plant GRs by providing two forms of access as expressed in Annexure 1 of ABS law in the Convention and for those non-disclosed and disclosed collections.[462] It is uncertain what the legal status of non-disclosed collection of material expressed in Annexure 1 of ABS law is, but ITPGRFA gives recognition to both.[463]

The ITPGRFA offers commonality and reciprocated benefits unlike IP law.[464] Its implementation requires the support of other institutions such as the Convention on the Nagoya Protocol. It is important to note that the agreement on ABS would fall outside the field of expertise of the Ministry of Environment delegates sent. It would be more appropriate to send representatives from the department of agriculture.[465]

IPRs provide market focused access to plant and GRs for food and agriculture. This issue has been raised by member states as it is inconsistent with the vision to accomplish access and fair benefit sharing for the purpose of conservation and food security.[466] The ITPGRFA gives a

[461] Tansey & Rajotte (2009) 115.

[462] Biber-Klemm & Cottier (2008) 291.

[463] Chiarolla (2011) 124.

[464] Chiarolla (2011) 291-292.

[465] B Pisupati *The ten questions to be addressed while developing national ABS framework* (2015) 19-20. See http://www.unctad.org (accessed 01 Nov 2016).

[466] Sanderson & Lawson (2012).

universal outline focusing on describing and preserving a 'commons' to lower transaction costs for conservation.[467]

According to the principle laid down in the ITPGRFA, member states who received plant GRs from international gene banks cannot apply for IP to restrict others from accessing the same material unless they share the benefit tributary or flows to a multilateral system.[468] The ITPGRFA, unlike ABS does not require negotiations between the user and providers, but creates a multilateral system and benefits flow back to the multilateral systems.

The key challenge with the ITPGRFA is the lack of a definite tool and the manner in which benefits are shared to support conservation.[469] It is not clear how the benefit sharing principle of a multilateral system can work in harmony with the increasing IP protection and have its way in agriculture.[470]

In conclusion, the issue of cooperation and mutual benefit through the current system has become complex, divisive and central to the current argument. It is necessary to create a standardised instrument which can be enforceable and allow member states to act accountably and transparently. It is equally important to have a body supporting the institution to monitor the access and utilisation of the plant and GRs appropriately with the aim to promote

[467] *FAO coherent food security responses: Incorporating right to food into global & regional food security initiatives* (2011)http://www.fao.org (accessed 1 Sep 2016).

[468] Tansey & Rajotte (2009) 116.

[469] Chiarolla (2011) 131-132.

[470] *Ibid* 144.

conservation and food security. The issue of implementing the treaty effectively has long been a concern for member states and needs to be addressed as a matter of urgency.

6.5 THE IMPLEMENTATION OF THE UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

The UPOV is the primary Convention to bring the identical system of IP into agriculture, although it differs with respect to its approach from that of patents.[471] According to Article 14(1) of the UPOV it provides and promotes exclusive rights of plant varieties to individuals for the purpose of commercialisation.[472]

The distinguishing feature of the UPOV is that it was developed for industrialised agriculture and established by 12 Western European countries for the protection of plant varieties.[473] From the start it provided motivation to the private sectors to get involved in the commercial exploitation of plant varieties.[474] Most developing countries raised their objection to the Convention affording protection focusing on industrialised agriculture.[475] The concern of developing countries is justified since their farmers would not fall in the category of lucrative or industrialised agriculture.

[471] Biber-Klemm & Cottier (2008) 207 & 81.

[472] *Ibid* 81

[473] Blakeney (2009) 81-84.

[474] M Nilsson *The in and out-licensing of plant varieties* (2011) 1019-1020.

[475] Lightbourne (2009) 87.

The only rationale behind developing countries becoming signatories to the Convention is that, after the adoption of TRIPS at the WTO, it was detrimental for member states to adopt a *sui generis* system.[476] Although the developing countries tried to respond to this challenge the situation remains controversial and unchanged.[477]

It is important to mention that the UPOV and patents are distinct from of IPRs with different criteria of protection, but interlinked with each other.[478] Even though the provisions of UPOV are similar to patent law, the requirement in the Convention defining novelty as a requirement is not necessarily the same in patent law. Patent law described novelty as a product which did not previously exist, while the UPOV focuses on a plant variety that must not have been commercialised before.[479]

The other criteria of the Convention are distinctiveness, uniformity with the initial one and unchangeable characters of the varieties as a precondition for the protection of plant varieties.[480] The protection of varieties in the Convention does not include their technical process, as in the patent law, but only protects the propagating material.[481]

The UPOV has been modified several times since its adoption in 1961. However, member states who do not ratify the new version may still apply the old forms.[482] The Convention is

[476] Biber-Klemm & Cottier (2008) 82-84.

[477] *Ibid.*

[478] *What is the relationship between patents and plant breeder's rights?* (2011). See http://www.upov.int (accessed 2 Feb 2017).

[479] *Intellectual property rights in plant varieties* (2003) http://www.fao.org (accessed 1 Nov 2016).

[480] *Ibid.*

[481] Chiarolla (2011) 81.

[482] Llewelyn & Adcock (2006) 82-83.

silent on whether the existing member states need to ratify the amended version or not, but the new members must only ratify the revised version of the Convention.[483] It is argued that such procedure may be adding complexity to confusion and consequently creates legal uncertainty.

In closing, it thus remains a challenge to implement the UPOV as it stands now as it has double standards for old and new member states; the old members still apply the old and the new members apply the amended version. The old clearly differs from the new version which still exists in one set of rules. Furthermore, the amended version allows dual protection by breeders' rights and IP, while the former prohibits it. There are still member states bound by the old version that have not ratified the new and this in itself creates legal uncertainty.

What is controversial is that the Convention is clearly tailored for an industrial farming community rather than for small-scale farmers and small-scale farmers no longer have the right to save seed under the Convention. The UPOV further provides the condition of a *sui generis* system as required by the WTO. The next part of the study will discuss and analyse IP requirements of agriculture under TRIPS.

6.6 THE IMPLEMENTATION OF THE AGREEMENT ON TRADE-RELATED ASPECTS OF INTELLECTUAL PROPERTY RIGHTS

The implementation of the TRIPS agreements of the WTO is seen as complex. As a consequence most developing countries have raised concerns, mostly on the issue of a lack of understanding of the legal subject matter. This is one reason among others which has caused

[483] *Ibid.*

the delay of the implementation of TRIPS.[484] Most developing countries in this regard are unwilling to comply with the provision of TRIPS due to fear of the loss of rights to their GRs and associated TK and cost of the implementation of the provisions and loss of protection of their GRs and TK could be outbalancing them under the existing structure.[485]

The global invention index of 2016 shows that developed countries are regarded as dominant in innovation and have strong economic establishments compared to the developing countries.[486] The primary problem with the provision of TRIPS is that it only maintains and protects the stronger economic powers on the globe and validates their products as inventions being afforded intellectual protection rights.

Broadly speaking the developing countries are there to serve the TRIPS agreements, as the provision is not well suited for the protection of traditional invention and GRs. The application of the provisions differentiates between traditional inventions of indigenous people and emerging technology of the developed world. As a consequence, TK and GRs are badly evaluated and the rights existences are expelled.[487]

TK is not a collection of unworkable information, but it is the source and consists of almost all scientific data presented by today's science and emerging technology.[488] It is argued that TK

[484] RS Repetto & M Cavalcanti *Provisions of the TRIPS agreement relevant to agriculture* 3. See http://www.fao.org Multilateral trade negotiations on agriculture-A resource manual/TRIPS (accessed 2 Sep 2016).

[485] *Ibid.*

[486] *Global innovation index* (2016). See http://www.wipo.int (accessed 28 Oct 2016).

[487] Repetto & Cavalcanti (2003) 37.

[488] *Ibid.*

and resources of indigenous people are products of their skills and knowledge. Today in most parts of the world TK and resources have been collected and used by researchers and scientists.[489]

Thus, the structure of TRIPS often confers a scope of exclusion that protects one over the other based on the economic importance of nations. In this context there is an obvious danger of unfair discrimination under the existing establishment rules that are beyond the reach of most developing countries.

This situation can be compared to the stage of development of countries and the lack of provision to protect the informal inventions of the developing countries that are the contributing factors delaying the implementation of the TRIPS agreement. The inability of developing countries to implement TRIPS goes back to its establishment.

It is certain that the developing countries were not well represented during the formulation of TRIPS. The policy makers and scholars who provided recommendations based them on the national interests of the developed world. The TRIPS agreement is unacceptable in its current condition and unless it is renegotiated to offset the misallocation of rights and protection, it is unworkable for the developing countries.

Finally, the key compromise which must be considered is that between the development stage of developed and developing countries. Countries should not be severely bound to comply with the rules when their economic and political development is vastly different. This causes Africa

[489] *Ibid.*

to be eliminated from effective participation in the shaping the global market; it is unlikely that the existing provision of TRIPS will effectively be implemented in the developing countries. The developing countries must be allowed to make their own informed choice to adopt the provisions suitable to their situation as far as the achievement of the implementation is concerned.

6.7 CONCLUSION

It has been seen that the establishment of the existing international institutions and policies mostly focused on a ‘one size fits all’ approach. This has caused complexities and confusion for implementation where countries differ with respect to their development stage and their priorities. The member states have to acknowledge that ‘one size fit all’ rules are inconsistent with the fair and equitable general application of the law.

The concluding chapter will suggest an approach that would be most suitable and result in inclusive hypothesised agreements. It is also evident that political and economic discourse is unlikely to settle the current unresolved issues between developing and developed countries.

It is likely that compromises have to be made in order to create a legal framework applicable to all. It is further necessary to discard some standards of economics and politics in the formulation of international rules and institutions. The high level of cooperation and peaceful coexistence of nations must be seen as the most prominent part in the formulation. Assuming that the will to renegotiate the existing international instruments and creating new institutional structures, which can accommodate all, exists, this could provide the way forward that satisfies certainty and the effective implementation of the law.

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CHAPTER 7

CHAPTER 7

Conclusions and Recommendations

7.1 CONCLUSION

'Law is made for man not man for law if it does not fit any more it should be re-evaluated and perhaps abrogated.' (Pope Francis)[490]

This study has investigated and evaluated the existing institutions, treaties and conventions governing food and agriculture in addressing food security, particularly in respect of weaknesses and constraints on their significance to countries in different stages of

[490] P Francis *A man of few and simple words* (2014). See http://www.huffingtonpost.com (accessed 11 Apr 2017).

development. In doing so, change in the international food law including IP law has been pursued.

The aim of this study is to expand the collective understanding of research on international food systems, including IP law, to examine a holistic and equitable approach for future global food security. This is significant because the increasing pressure on the current food system, especially in Africa, to ensure adequate food supply to provide for the growing population is huge. Often the influence of the international legal framework on food security has been overlooked, but it has a clear detrimental effect.

During this study a number of works on IP law and food security have been discussed in the context of the complex political, economic and historical background of global food and agricultural law. This study focused on the non-inclusive formulation of rules and regulations governing food and agriculture to bring it into context with the unequal results they have.

The study addressed the main disciplines of agriculture, economics and law and it is suggested that the three disciplines are intertwined with one another. On the one hand agriculture without economics cannot sustain itself and therefore, fair and equitable trade is compulsory to improve agricultural productivity to eliminate food insecurity. On the other hand, without an effective and appropriate legal framework there will be no distributive justice and change in the existing international food law may lead to a fairer result for future food security. The study stresses the importance of the need for the main disciplines to be taken into account in restructuring the law.

The study investigated and evaluated the case of Southern African, particularly the San communities' experience, as a classic study to serve as example of how the most vulnerable communities of the globe are affected under the current international food system. The qualitative data in the case study helped the in-depth explanation of the social ills that are highlighted in this study and allowed the exploration and understanding of the root cause of food insecurity.

It is seen that the current food and agriculture policies and systematic genetic fixing in agriculture is strengthening the corporations, but negatively impacting on the ordinary farmers and vulnerable communities. Although the study doesn't disregard technological development in agriculture, it recommends an inclusive recognition and empowering of traditional communities and ordinary farmers at the same level provided to the industrialised farming communities.

7.2 A RESTRICTED APPROACH IN ANSWERING THE RESEARCH QUESTIONS

Is the current IP law capable of facilitating and supporting the goal of ending hunger and increasing food security?

Although food insecurity is a complex issue and has one too many faces, achieving food security must not be considered as impossible. It is argued that protecting the erosion of biodiversity and TK through rules and regulations is a prerequisite to having a sustainable global food system.

It is apparent that the existing IP law application on plant, GRs and associated TK has failed to adequately protect and recognise the right to food. There are no existing disclosure provisions that could capture all the existing concerns about GRs and associated TK relevant patented inventions. As a result, traditional communities have benefited the least and are squeezed out of participation in the global economy. Agriculture cannot sustain itself without economics. The imbalance in the global trade in agriculture and systematic ownership of global food in the hands of few further dislodged ordinary farmers from farming and needs to be addressed.

The study also saw that the limited participation of developing countries in the negotiations and the formulation of the multinational systems addressing their priorities and needs, hindering the effective implementation of the systems. In examining the political and economic implication of IP law it is clear that generated profit flows only to the developed world leaving the developing world in poverty and food insecurity. It should be remembered that the majority of IP product export countries focus on such profit flows. Their success in international relations depends as much upon the effort concerned as on the countries' private entities and lobbyists.

The study has explored the principal failings of IP law especially in addressing food security and the call is to its improvement to achieve some sort of common legal framework. Food security and safety of the global population are at a critical stage, in some parts more than others, and need to be taken seriously and considered when restructuring international law based on necessity and not politics. The moral issue is to try to find a balance.

Will the current international food law promote fair and equitable food production and supply practices to benefit all who need it?

For a number of years, countries have been proposing the introduction of fair and equitable applications and interpretations of multinational systems such as patent law beyond countries' political and economic positions. However, this proposal seems to lack an in depth assessment of the extent of harm aggravated by the system with regard to the critical situation of present and future global food security. The current international food system creates gaps in the process of promoting fair and equitable production and supply practices to benefit all who need food.

Despite the effort made by the WIPO to promote social responsibility, such as food security, health, technology transfer and poverty alleviation, the results have not been sustainable. The opinion that IP driven agricultural development will increase food security is perhaps one side of the story. The fact facing developing countries is that corporations increased the production of food but that their control of food does not benefit the vulnerable communities of the globe due to the question of affordability and accessibility of the food available in the market.

It is important to take a serious look at the persistence of food insecurity and poverty in the developing world. The failure of the call for the improvement in the current mode of the 'one size fits all' application of the international systems has to be recognised.

In stressing the positive look toward future food security, the current international food system needs to be change. There is a need to create international legal certainty, provide clear direction and participation of the affected communities in the restructuring of an appropriate

global legal framework. It is also equally important to have institutional mechanisms to enhance the implementation in every sector of society.

Will the existing international food law, including IP, create incentives for farming practices that are ecologically sound as well as culturally and socially appropriate?

This study sought to expose the primary gaps in the existing law governing food and agriculture. Gaps are evident from the findings of the study as they describe the weaknesses and constraints of the international food systems in answering the question.

Food and Agriculture Organisation treaties were established with the objective of serving global communities' needs for the conservation and utilisation of plant GRs. This resulted in the gene bank being established to safeguard the global plant GRs and information. There is no provision to describe the legal status of plant, GRs and information kept in the gene bank. The absence of an effective legal framework, which could prevent misappropriation, resulted in an imbalance between ordinary farmers and commercial farmers who have the means to easily access the gene bank. The argument is for appropriate legal frameworks that could result in allocations which are morally preferable in ensuring equitable justice.

Out of this concern the **Convention on Biodiversity** was established with the objectives to promote access and benefit sharing between users and providers. The weakness of the Convention is that the compliance entirely depends on the accountability and transparency of the parties as the Convention has no clear indication how the access and benefit sharing should be managed. Furthermore, there are conflicting interests between sovereign rights conferred by the Convention and intellectual property rights. The structure of the law in this regard clearly

has no moral guidance and therefore affects the sharing of economic benefit and it puts a burden on ordinary farmers giving access to the resources and knowledge without benefit sharing.

In an effort to bring clarity to the provision of the CBD with regard to ABS, **the Nagoya Protocol was adopted** in 2010. The protocol promotes access to GRs and the fair and equitable sharing of benefits (ABS) arising from the utilisation of GRs and to advance the implementation of the provision.[491] Despite the provisions provided in the framework for the implementation of ABS agreements for the utilisation of GRs and associated TK between the user and the provider, they are not yet seen as fully operational. The institutionalised framework of the Nagoya Protocol established ABS agreement does not give a clear instruction to ensure legal certainty to achieve its own objectives.[492] Recently on 6 May 2016, an effort was made to address this challenge in the implementation of the ABS agreement.

The most controversial and important provision of the **Trade-related Aspects of Intellectual Property Rights** for agriculture, biodiversity and food is Article 27(3)(b) of this agreement. The provision encourages strong protection of biotechnology and excludes protection of traditional invention by ordinary farmers. It is hard to reconcile that the TRIPS provision confers IP rights while the relevant provision of the CBD confers sovereign rights. This is especially so considering the limited technological capacity of most developing countries and their restricted patent applications on traditional agriculture invention. It is therefore are not surprising that developing countries express their dissatisfaction in this regard. Principles of distributive of fairness should therefore best be understood as providing moral guidance for structuring the legal framework.

[491] *Access and benefit sharing (ABS)* (2011). See https://www.cbd.int (accessed 14 Feb 2016).

[492] JC Cabrera et al *Overview of national and regional measures on access and benefit sharing challenges and opportunities in implementing the Nagoya Protocol*, 3rd ed (2014) 22-25.

The **International Treaty on Plant GRs for Food and Agriculture** sought to promote the multilateral system of access to plant and GRs and allows IP protection in terms of the rule to benefit the flow to the multilateral system. The weakness in the provision does not address the issue of IP, but merely recognises and allows IP protection in agriculture. The argument is that countries exporting IP products are benefitting most from this treaty. This needs to be addressed as it provides a similar position as in the CBD with the highly differentiated position between developing and developed countries.

Furthermore, the **Union for the Protection of New Varieties of Plant** was adopted with the primary objective of bringing an identical system of IP into agriculture, but it differed slightly in its approach. The Convention gives exclusive rights on plant varieties to individuals for the purpose of commercial exploitation. The problem with the prescribed eligibility criteria under the Convention is that particularly novelty depends on the principle that the plant variety has never been commercialised before. This could jeopardise the ordinary farmers who have previously not participated in commerce, but produced to meet basic needs and strive to participate. The law negatively affects ordinary farmers with immense ecological knowledge and agricultural inventions of their own. Therefore, an appropriate structure in the legal framework is important because the economic distribution resulting from the law fundamentally affects people's lives.

It is argued that the current international food and agricultural systems as evaluated are not creating adequate incentives for farming practices that are ecologically sound as well as culturally and socially appropriate. Unless the system changes and addresses the non-inclusive formulation of the existing international food systems, food insecurity will continue to persist.

The desired call in this study is fair and equitable protection for both emerging and traditional invention which must be achieved for sustainable development in agriculture.

7.3 POSSIBLE WAY FORWARD

The difficulty in promoting an equitable and fair legal framework with all member states has long been associated with the different stages of development and was blamed on the system. For instance, the current international IP law single application has a prejudicial effect on the developing countries where their needs and interests have not been sufficiently addressed in the system. The time when many of the international instruments were adopted and negotiated, most developing countries were not present and their needs and interests have never been addressed. The question here is not that of the legal theory, but has more to do with the history of developing and developed countries.

This study suggests that the way forward is first to understand the different levels of development of the member states and their priorities. The second step would be to find the appropriate restructured legal framework which could to a greater extent incorporate and address the needs and interests of all the member states. The outcome should find a balance and accommodate those countries at present being neglected.

As it is now, the uncertainty of the current international systems is real. The experience of the developing countries in this regard makes them concerned about the way in which the system can remain operating to their disadvantage. At the time of the drafting of the existing international systems, political harmony was clearly lacking. It is therefore are not surprising

that the predominant opinions of most developing countries in the current international systems are against the international systems.

7.4 USING THE IDENTIFIED RECOMMENDATIONS TO RESTRUCTURE THE EXISTING GLOBAL FOOD AND IP LAWS

This study proposes that a legal framework that is more conducive to creating a fair and equitable system that would ensure the needs and interests of all member states are addressed must be formulated. It should work in harmony to promote food security and poverty alleviation as the priorities. It is possible that such an approach will provoke controversy. It is therefore important to avoid uncertainty in the international legal system on the way forward.

Food insecurity in not a national problem; it is an international problem and global and strong partnerships among world leaders are vital to guard future food security. 'A hungry man is an angry one' Buchi Emecheta said and this is still valid. It is not difficult to understand that food insecurity has a tendency to increase global risks of social and political instability. As a result people sometimes migrate by either running away from the angry man or fear of future food insecurity or hunger, which cannot be ignored as it will affect our future peaceful existence.

It is therefore important to gain a broader and more general understanding of what the interests and priorities of other nations are to achieve a better meaningful and practical outcome. Without the implementation of such improvements in the law in the near future, the world would be left with the uncertainty of the present system.

The lack of improvements of the system in the near future as suggested would cause an unnecessary delay in solving the long-standing social ills such as poverty and food insecurity and these would therefore be further aggravated.

At some point the international legal and political setting may well change following the implementation of changes of law in this regard between developing and developed countries. It is clear that the meaningful commitment to harmonise the international food systems as a prerequisite would most likely have to come from the developed world.

Currently, there are no existing compulsory disclosure provisions that could capture all the existing concerns about plant, GRs and associated TK of the most vulnerable part of the global communities. This should be addressed. In stressing a feasible way forward this thesis recommends that a change in the existing international law governing food and agriculture is unavoidable.

The intended law should acquire the tenancy of respect and reserve culture and tradition in farming. This will help to support and promote traditional economies and encourage upcoming invention in agriculture within the communities to mitigate food insecurity and promote food self-sufficiency and ensure the right to food.

For this reason this thesis recommends that a solution is carefully sought in an inclusive and well-balanced legal framework governing food and agriculture. This will result the distribution of economic benefits and burdens fairly across members of the global society. The principle of the distribution of justice is therefore seen of as providing moral guidance for the restructuring

of the legal framework. This could result in more sustainable farming practices ensuring food security and preserve culture and tradition for our peaceful existence. Based on this analysis it is recommended that Africa adopts appropriate national as well as regional agriculture and food law to mitigate and avoid the aggravating factors of food insecurity.

It is apparent that the existing international food and agriculture law, including IP application in agriculture, failed to adequately protect the right to food and food security, especially in Africa. In the absence of agriculture and food law in Africa, both nationally and regionally, it is recommended that the institutions start equipping students in the field of agriculture and food law with the necessary knowledge and practical competencies relating to the vital legal principles and common practices applicable to agriculture and food in Africa.

Today Africa's courts are poorly trained to deal with matters of the ever growing and changing agriculture and food industries. Especially, our court has limited technical expertise and little institutional authority to conduct the necessary analysis in the absence of agriculture and food law drafted by the legislature. The food and agriculture industries' technological development from other parts of the world are growing at an alarming pace without limits. Our law does not understand this and our institutions are not responding, but the industries are taking over the food market and running their businesses in the absence of law throughout the continent.

The recommended module, if adopted in the institutions, could equip law graduates with the necessary knowledge relating to vital legal principles in food and agriculture. It will further equip students to identify the different actors and avenues of food governance, to engage them on some of the most pressing issues in African society, food insecurity. It would also help them

to present a legal argument regarding food and agriculture in court and to analyse the legal issue based on an existing issue of food insecurity in finding solutions.

The recommended module should cover food security, identify the private and public space of food governance, IP application in agriculture, genetically modified food and biotechnology, rights of farm workers, the global food regime, agricultural trade, agricultural subsidy, foreign direct investment in agriculture, food aid and food waste. The course could also be presented as a short course for legal practitioners by the institutions to equip understand the complex legal scenarios relating agriculture and food in our society.

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