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Master thesis

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PATENTS ON GENETICALLY MODIFIED FOOD, THE RIGHT TO FOOD AND FOOD SECURITY; FINDING THE MEANINGFUL BALANCE

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Dedication

For my mother… a long thank you for your energy and enthusiasm in all my work.

Acknowledgement

I would like to express my profound appreciation to Prof. Mpazi Sinjela, Director-WIPO Worldwide Academy, for the guidance and supervision throughout my writing. My gratitude too to colleagues and staff at the Raoul Wallenberg Institute of Human Rights and Humanitarian Law for their input encouragement and inspiring working environment throughout the time of my study. Finally, I owe my family and friends so much for their readiness always to listen to my stressful tales during my writing.

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Abbreviations

ARIPO	African Regional Intellectual Property Office
DNA	Deoxyribonucleic acid
FAO	Food and Agricultural Organization
GATT	General Agreement on Tariffs and Trade
ICESCR	International Covenant on Economic, Social and Cultural Rights
IP	Intellectual Property
IPRs	Intellectual Property Rights
MNCs	Multinational Corporations
OECD	Organization for Economic Cooperation and Development
PGRS	Plant Genetic Resources
R&D	Research and Development
TRIPS	Agreement on Trade Related Aspects of Intellectual Property Rights
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

i) Introduction

The grave food crisis that is afflicting the people of the developing countries where most of the worlds hungry and ill nourished live, and where more than two thirds of the world population produce about one third of the worlds food, remains an imbalance, which threatens to increase in the next ten years.[6] This imbalance is not only fraught with grave economic and social implications but also acutely jeopardizes the most fundamental principles and values associated with the right to life and human dignity as enshrined in the Universal Declaration of Human Rights.[7]

Issues of intellectual property rights have in recent years become increasingly relevant in diverse policy areas including trade, health, culture and heritage, investment, environment, food security, scientific and technological progress.[8] Corollary to this, *patenting of life forms for commercialization*[9] poses new challenges for intellectual property and human rights while at the same time emphasizing further the inter relation between the two disciplines.

The adoption of the TRIPS Agreement in 1995 as an integral part of the Agreement establishing the World Trade Organisation has been described as a milestone in the history of intellectual property because the TRIPS Agreement is 'the most comprehensive international legal instrument on intellectual property rights.'[10] It embodies provisions of earlier instruments on intellectual property like the Berne Convention on the protection of Copyright and Related Rights and the Paris Convention

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[6]This imbalance was emphasised and re-stated in the preamble of the Universal Declaration on the Eradication of Hunger and Malnutrition by the World Food Conference convened by the United Nations General Assembly under General Assembly Resolution 3180 (XXVIII).

[7]See the preamble and article 3 of the Universal Declaration of Human Rights. For a more detailed compilation of the different Human Rights Conventions that relate to the rights to food and life, see K. Tomasevski: ***The Right to Food, Guide through applicable International Law*** (1987) Martinus Nijhoff Publishers.

[8]World Intellectual Property Organisation &Office of the United Nations High Commissioner for Human Rights, on the 50th anniversary of the Universal Declaration of Human Rights: ***'Intellectual Property and Human Rights***' in the foreword by Mary Robinson and Kamil Idris.

[9]If you take the case of the United States of America, largely between 1997 and 1999, gene-modified ingredients suddenly appeared in 2/3rds of all US processed foods. This alteration was fuelled by a single supreme court ruling in ***Diamond, Commissioner of Patents and Trademarks vs. Chakrabarty, 447 US 303 (1980),*** allowing for the first time the patenting of life forms for commercialisation. While food and agricultural companies welcomed this, human rights activists have opposed it in the context of its disadvantages which shall be discussed later in this paper. For a more detailed understanding of the American situation, see Nathan Batallion: ***'50 Harmful Effects of Genetically Modified Foods.'*** Available at (www.cqs.com/50harm.html), accessed on 2/2/2004.

[10] Peter Drahos and Ruth Mayne, ***Global Intellectual Property Rights:Knowledge, Access and Development,*** Palgrave Macmillan, 2002. See the article by Peter Drahos at p.1.

on the protection of Industrial Property. It was thought that its successful adoption sorted out all the problems of intellectual property rights protection, but in reality, the situation is different.

TRIPS provides minimum worldwide standards for IP protection. Its article 27(3)(b) is revolutionary in that it provides, for the first time in an international treaty, for the patenting of life forms. Traditionally, patents have been available for industrial/mechanical inventions only.

Article 27(3)(b) of TRIPS nevertheless offers some flexibility in that member states may exclude from patentability certain life forms eg plants and animals. Certain inventions may also be excluded from patentability in order to protect morality, protect human, animal or plant health or protect the environment as per article 27(2) of TRIPS. However there must be IP protection for plant varieties ie either by patents or an effective *sui generic* system.

The TRIPS Agreement has been criticized by many scholars and activists championing human rights in particular advocates for access to cheap medicines, access to food and bridging the divide between north and south, as well as environmentalists, calling it a barrier to the achievement of these goals. This criticism finds support in the fact that people in developing countries have problems accessing medicines and food- among other necessaries of life. Due to exclusive intellectual property rights, medicines and food are rendered too expensive and well beyond the reach of most people in these countries. This is compounded by the ever-escalating poverty levels.

On 17th August 2000, the United Nations Sub Commission on the promotion and protection of human rights adopted a resolution concerning the impact of the TRIPS agreement on the right to food.[11] It noted that potential conflicts exist between the Agreement and the realization of economic, social and cultural rights in relation to, for example, the consequences for the enjoyment of the right to food. It further noted that the TRIPS agreement does not adequately reflect the fundamental nature and indivisibility of all human rights.

Powerful MNCs in the life sciences industry (mainly pharmaceuticals, chemicals, agro-chemicals and seed corporations), based in developed countries particularly USA, have driven this expansion of patentable subject matter to now include life forms.

Today, up to 13 multi-national corporations (herein after referred to as MNCs) own 80% of the patents on genetically modified food (herein after referred to as GM food) and almost the whole global market is controlled by five agro-chemical companies.[12] This puts some limits on

[11] UN Doc. E/CN.4/Sub.2/2000/7.

[12] CIDSE: ***'Biopatenting and the threat to Food Security,'*** 2000, available at (www.cidse.org/pubs/tg1pppre.html), accessed on 2nd February 2004.

the possibilities for small-scale farmers especially in the developing world. These shall be discussed later in the paper.

The nexus between life and food justifies the need to develop systems of technology that can guarantee sustainable availability and accessibility of food to all the people of the world. In this context it is arguable that agricultural biotechnology and genetically modified food in particular, if seen as a technological means of guaranteeing such availability and accessibility in more nutritious and necessary quantities would go a long way in solving this crisis.

But issues of biotechnology where genetically modified food falls need critical analysis before they can be adopted for the world otherwise we may have far reaching and undesired effects which may only be realized too late.

ii) Research Methodology

This thesis is mainly based on research work at the library of the Raoul Wallenberg Institute of Human Rights and Humanitarian law and relevant information found on the internet particularly the WIPO web page.
I also made study visits and conducted interviews at the following institutions in Uganda: the Ministry of Agriculture-Uganda, Ministry of Trade and Industry, Faculty of Law-Makerere University, World Vision International, National Council for Science and Technology, the Rockefeller Foundation and World Food Programme.

iii) Research Outline

Chapter 1 studies the historical development of human rights and intellectual property rights, analyzing the interactions and interrelations between the two systems. It highlights similarities, differences and potential tensions showing the need for a balance of rights where the need arises. The chapter also discusses the concept of a patent, analyzing its justifications. Chapter two discusses TRIPS, biotechnology and the right to food. The chapter also throws more light on the inclusion of intellectual property on the TRIPS agenda. Chapter three tries to explain biotechnology with specific and in depth discussion of GM f[13]ood, showings its possible benefits and disadvantages while chapter four discusses the right to food and food security under international law. There shall be recommendations and the conclusion.

It should be noted that in the discussion of GM food, it is predominantly examples from the USA that are used. This is because America has played the leading role in developing and utilizing GM foods in the world, while the European Union and Africa are still debating whether

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to allow them in. However noteworthy too is the speed with which American agro-business companies are moving to introduce their GM food into markets of the developing world.

Chapter one

1.1 The Historical Development of Intellectual Property Rights

Intellectual property refers to the creations of the human mind, the human 'intellect.' It is therefore incorporeal private property, which has creativity, innovation and market distinctness of a certain kind as its subject matter. It is a generic term referring to the intangible objects and probably came into regular use during the 20th century. This is because it was customary to refer to industrial and IPRs. The term 'industrial' was used to cover technology-based subject areas like patents, designs and trademarks. 'IP' was used to refer to copyright. The modern convention is to use 'IP' to refer to both industrial property and copyright.[14]

Originally, IPRs were intended to foster the technological and industrial progress of the state granting the patent. The major function of IPRs especially the patent regime, was economic self sufficiency. The rights of inventors were only the corollary of the monopoly conditions deemed appropriate for such exploitation, while the rights of foreign inventors were completely disregarded. The law therefore did not protect the property rights of the original inventor as such, but permitted the importer of the invention to exercise rights similar to those of the original inventor. Under these conditions patent law did not serve to promote the position of the inventor.

The different subject areas of IPRs originate in different places and at different times.[15] Some state that the origins of IP date back to Aristotle in the 4th century BC while others to 9th century China.[16] However the Venetians are credited with the first properly developed patent law in 1474 and their model spread to other European states.[17] In England, the statute of Monopolies of 1623 swept away all monopolies except those made by the 'true and first inventor' of a 'method of manufacture.'[18]

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[14] Peter Drahos ***Intellectual Property and Human Rights*****.** 1999 IPQ. No.3, Sweet & Maxwell, p.350

[15] IPRS are those rights derived from human intellectual creativity. These rights protect the interests of the inventors by giving them property rights over their creativity/inventions. IP law is today divided into two branches: Industrial Property Law and Copyrights Law. There are different forms of industrial property rights eg plant breeders' rights, patents, petty patents/utility models, geographical indications, trademarks, undisclosed information/trade secrets and industrial designs. Each industrial property right has different requirements and grants different rights.

[16] Chapman Audrey. ***Approaching Intellectual Property as a Human Right: Obligations Related to Article 15(1)(c) of the International Covenant on Economic, Social and Cultural Rights. Committee of Economic, Social and Cultural Rights. 24th Session. November-December 2000. E/C.12/2000/12 at p.4.***

[17] Peter Drahos, *op cit.*, at p.350.

[18] *ibid*.

Modern copyright law began in England with the 1709 Statute of Anne.[19] In 1791, France recognized the rights of inventors because in the context of the 1791 law it provided a right of representation to authors, it was argued that 'the property of the work which is born of the writers thought is the most sacred, the most legitimate, the most unassailable and the most personal of all properties.'[20]

The US constitution of 1787 justifies the legislative authority granted to the Congress in IP matters on grounds of public interest by stating that '…the Congress shall have power… to promote the progress of science and useful arts, by securing for limited times, to authors and inventors the exclusive right to their respective writings and discoveries.[21] In 1790, the US enacted a patent law.

It is notable that during the first half of the 19th century when some states in Europe were adopting patent laws, there arose an anti- patent movement in other quarters. Britain, Germany, the Netherlands and Switzerland saw the patent system experience the greatest challenge.[22] In Switzerland, the legislature rejected proposals in 1849, 1851, 1854 and twice in 1863 to adopt patent laws on the ground that the 'economists of greatest competence' had declared the principle of patent protection to be 'pernicious and indefensible'[23] The anti-patent movement saw patents as unfair and giving rise to anti-competitive behavior in the marketplace.

Nevertheless, the patent advocates march was not stiffled by the anti patent movement. The second part of the 19th century therefore saw the proliferation in Europe of national IP systems. IP was developed on a national basis, with considerable diversity in the nature of protection. Outside Europe, IP grew along colonial paths, for instance the British colonies in Africa, Asia and the self governing colonies of Australia and Canada, enacted copyright and patent laws which were identical to those in England.[24]

This period is dominated by the principle of territoriality, the principle that IPRs do not extend beyond the territory of the sovereign, which has granted the rights in the first place.[25] This meant that an IP law passed

[19] Audrey Chapman *op cit***.,** p.4**.** This statute was to encourage its citizens to bring in foreign technology for the benefit of the national economy.
[20] See paper by the Secretariat of the WTO. ***Protection of Intellectual Property under the TRIPS Agreement.*** Committee on Economic Social and Cultural Rights. 24th session. November 2000. United Nations Geneva at p.1.
[21] *ibid***.**
[22] Fredderick Abbot, Thomas Cottier and Francis Gurry: *International Intellectual Property Systems*: *Commentary and Materials*. Part one. 1999. Kluwer Law International. Hague p.7.
[23] *ibid*. Then Geig Chemical Company of Basel Switzerland likened patent monopoly to robbery; today the same company (Ciba-Geigy) is a major crusader of patents for the corporate sector. Don't times really change?
[24] *ibid.*
[25] *ibid.*

by country A did not apply in country B. This principle showed the interrelationship between state sovereignty, property rights and territory. As a result IPRs owners faced a problem, due to the free copying of their creations in other countries. Inevitably, it led to the need for expansion of IP protection within the international sphere.

1.2 The International Sphere

In the 19th century, states begun to take a greater interest in the possibility of cooperation in IP. The development of national IP systems and international trade raised awareness of the need for international protection.

In the UK, in response to the free riding problem, the 1838 and 1844 Acts that protected works first published out side the UK were passed.[26] These Acts introduced the principle of reciprocity, which meant that foreign works would only gain protection in the UK if the relevant state agreed to protect UK works. The 1844 Act saw a considerable number of bilateral agreements concluded between the UK and other European states.[27]

However there were some states that remained isolationist, notably the USA. The 1790 US Copyright Act only granted copyright protection to citizens and residents of the USA. This form of national protectionism prevailed for a long time.

Never the less, like copyright, other branches of industrial property law also became the subject of bilateral agreements and by 1883, there were 69 international agreements mostly dealing with trademarks.[28]

They introduced the principle of national treatment, which principle was based on the reciprocity principle developed in the UK. States realised that if they did not discriminate between nationals and foreigners in the regulation of IPRs, neither would other states. Therefore in this way states could secure protection for the works of their authors in foreign jurisdictions.

The adoption of various bilateral agreements in IP in the 19th century was important in that it contributed to the recognition that an international framework was needed. These agreements also provided a framework of principles that the international regime could work with, although the level of protection was not satisfactory.

Following the international exhibition of inventions held in Vienna, Austria in 1873, developments towards international protection of

[26] ***ibid.***
[27] ***ibid.***
[28] ***ibid.***

inventions stepped up. This led in 1883, to the adoption of the Paris Convention for the protection of Industrial Property (Paris Convention).

Industrial property rights were developed as a way to reward creativity and promote innovation during the Industrial Revolution and thus were limited to industrial/mechanical inventions. These rights stimulated human intellectual creativity for the benefit of the public and promoted trade in services and goods.

In 1886, the Berne Convention for the protection of Literary and Artistic Works (Berne Convention) was also adopted. These conventions ushered in an era of international cooperation in international IP regimes.

These conventions were the first international agreements on IP, mainly drawing membership from European states.

Later after the Second World War, and the emergence of states from the colonial period, their membership increased, largely drawn from the developing countries. Over the years, the conventions have also gone through a series of amendments to keep up with technological advancements.

With more international IP agreements being adopted, in 1967, an international agreement established WIPO to administer them.[29] Member states agreed on basic principles the most important being the principle of national treatment but states still retained a lot of discretion on the standards of IP within their jurisdiction. There was thus no harmonization of IP standards across states.

1.3 The Global Era

With the increasing interdependence of national economies, a need for an effective international legal system to regulate IP matters was identified, particularly one that ensured a harmonization of IP standards among states.

Up to this time, despite the existence of international IP agreements administered by WIPO, there was still a lot of free riding or copying of works and inventions that was tolerated. The only enforcement mechanism under the various international IP treaties was an appeal to the ICJ and most states entered reservations on such clauses.[30]

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[29] International secretariats were established for both the Paris and Berne conventions. These then merged to form a 'United International Bureau for the Protection of Intellectual Property.' WIPO superseded this institution and is now responsible for the promotion of IP worldwide. It administers several IP treaties and also acts as a secretariat for the negotiation of treaties that establish new norms in IP. It also conducts extensive training and technical assistance programs for developing countries.

[30] Peter Drahos, *op cit.*, p. 355.

For the USA however, the lack of an effective enforcement machinery for IPRs under WIPO was detrimental to key industries of the national economy, such as film and pharmaceuticals.[31] For the US pharmaceutical companies for instance, IP was an investment issue. They wanted to locate their production anywhere in the world safe in the knowledge that their IP would be protected. With intensive lobbying these industries succeeded in linking IP to trade. The immediate advantages of such an approach were first, if the IP standards were made a part of an international trade agreement, it would give those standards a truly global coverage. Secondly IP would now fall under the enforcement mechanism that states had developed for settling trade disputes.

Beginning in 1984, the US amended its 1974 Trade Act several times providing for a bilateral enforcement mechanism against countries that did not have adequate and effective levels of IP enforcement.[32] It included IP in the 'section 301' trade process, such that if countries failed to act on IP they would face trade sanctions from the USA.[33]

Further under the initiative of the USA (particularly its business community) IP was included as a negotiating issue at the ministerial meeting at Punta del Este during the launch of the Uruguay Round of Multilateral Trade negotiations held under GATT.[34]

On April 15th 1994, the Uruguay Round concluded with the signing in Marrakesh, Morocco of the Final Act embodying the results of the Multilateral Trade Negotiations. The Final Act contains the Agreement establishing the WTO and several annexed agreements. TRIPS is found in Annex 1C of the WTO Agreement.[35] TRIPS came into force on 1st January 1995,although it gives members transitional periods to bring themselves into compliance with its rules, which differ according to their stage of development.[36]

After TRIPS was adopted, other international IP treaties have since been concluded under the aegis of WIPO. In 1996, the WIPO Performances and Phonograms Treaty and the WIPO Copyright Treaty were

[31] *ibid.*
[32] *ibid.*
[33] *ibid.*
[34] *ibid.*
[35] TRIPS is the most comprehensive multilateral agreement that sets out detailed minimum standards for the protection and enforcement of IP. It is known either as a Paris-plus Berne-plus agreement because its standards incorporate those of the Paris and Berne conventions in their most recent form and also includes standards on certain matters where the pre existing conventions are silent or are seen as being inadequate. However article 6bis of the Berne convention on authors' moral rights was not incorporated into TRIPS.
[36] Developed countries had until 1 January 1996 to comply with TRIPS, developing countries had until 1 January 2000 while least developed countries have until 1 January 2006.

concluded to deal with the new technological developments in the digital area. Current international IP law is modelled on western IP tradition rooted in the idea that IPRs are positive rights created by the state for the benefit of its citizens.[37]

While WIPO identifies that IP legal regimes firstly give statutory expression to the moral and economic rights of creators in their creations and secondly that they provide incentives and rewards to inventors and creators and thereby stimulate economic and social development, states have used IP laws as a means to improve their countries competitive economic advantage.[38] This has become increasingly dominant in this globalization era. TRIPS favors major economic interests, particularly large MNCs, to the detriment of protecting public access and benefits in the home country and promoting development in developing countries.[39]

The economic importance of IP has grown with the increasing role of information and knowledge-based industries. A causal link has been created between IP as an inventors right and a creators right. A historical analysis on the emergence of IP reveals that they have always been used by states to secure market place objectives, both domestic and international. IPRs are still viewed as an economic tool facilitating trade and investment. The linkage between IP and trade is made even clearer by the adoption of TRIPS.

1.4 Historical Development of Human Rights

What we commonly define as human rights today can be traced to various world religions and philosophies. In the holy books of Christianity, Islam, Budhism, Judaism, Confucianism and Hinduism, there is a call for the more humane treatment of fellow human beings. In the Middle Ages in Europe, various social contracts bore the same ideas.[40] The concept of human rights was also further developed during the time of the enlightenment, setting down the basis of rights derived from Natural Law -iura naturalia, and the recognition of the right of all humans to freedom and dignity.[41]

From the 16th century onwards, prominent philosophers and jurists later developed the notion of natural rights, as another source of law, ie the law of Nature. Hugo Grotius (regarded as the father of modern international law), Samuel von Pufendorf, John Locke, Jean Jacques Rousseau and Charles de Montesquieu all based their work on the notion

[37] *ibid.*
[38] Audrey Chapman, *op cit*, p.5.
[39] *ibid.*
[40] For example, the Ceasar Hadrians basic laws for Roman Law, the 1215 Magna Carta Libertatum in England, the 1282 Erik Klippings Handfaestning in Denmark, the 1356 Joyeuse Entrée in Brussels, the 1579 Union of Utrecht in the Netherlands, 1689 Bill of Rights in England. See Gudmundur Alfredsson et al *International Human Rights Monitoring Mechanisms.* 2001. Kluwer Law International. Hague p.19.
[41] *ibid.*

that above positive law existed another source of law, the Law of Nature.[42] This natural law had roots in human reason and could be discovered without any knowledge of the positive law. Rousseau observed that the sovereigns derived their powers from this source and were thus also to obey and respect it while Montesquiue developed the concept of separation of powers.

An important aspect in human rights law is the principle of the equal dignity and worth of every human being.[43] These religious, moral and ethical basic notions of human value from natural law were later transformed into positive law, at the national and international levels.

The 1776 American Declaration of Independence, the 1781 Bill of Rights of the American Constitution, the 1789 French Declaration des Droits de l'Homme et du Citoyen (Declaration of the Rights of Man and of the Citizen) and the 1793 Declaration are all based on the notion that all human beings have equal status and have certain inalienable rights.

Human rights during the 18th and 19th centuries were related to the freedom of the individual and the need for citizens to be protected from infringements of these freedoms by state power. The principle of equality pressed for the need of the government to strive to improve the living conditions for the wider population. Therefore many constitutions drafted at this time, contained provisions in the areas of social and economic rights and not just the classic freedoms.[44]
The general right of property was recognized by the liberal traditions of France and the USA. The French Revolution (which resulted in the 1789 Declaration) is said to have explicitly manifested the idea of IPRS as natural rights[45]- as opposed to positive rights (granted by the state), hence providing a human rights approach to IPRs.

The 1789 Declaration included property among the natural and imprescriptible rights of man.[46] The freedom of communication and the press that the 1789 Declaration proclaimed was made concrete once printers no longer had to obtain the privilege of printing from the King.[47] However it is observed that in actual fact the French Revolution was much more about the liberation of information than the creation of property rights in information.[48]

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[42] *ibid*, p.20.
[43] The Preamble of the UDHR recognizes the 'inherent dignity and equal and inalienable rights of all members of the human family and 'in the dignity and worth of the human person and in the equal rights of men and women.
[44] Alfredsson G et al, *op cit*, p. 22. For example, the Norwegian Constitution of 1814, the Mexican Constitution of 1917, the Constitution of Soviet Union of 1918.
[45] In the modern context, the notion of a natural right might often be replaced by an appeal to a sense of equity and fairness. It is seen as fair that for example an inventor would draw some benefit from others using the fruits of his or her creative efforts for economic gain.
[46] *ibid*.
[47] *ibid*.
[48] Peter Drahos, *op cit*, p. 351.

1.5 Human Rights and the United Nations

The United Nations was created on June 26th 1945 at the Conference of International Organizations in San Francisco, USA. The signing of the charter of the United Nations was a significant step in bringing human rights under the sphere of international law. The charter establishes the protection and promotion of human rights as one of the main objectives of the organization.[49]

The second world war where the Nazi regime in Germany founded a power base on terror and gross violations of the rights of persons residing within its jurisdiction spurred the creation of the UN, an organisation that would work to 'save succeeding generations from the scourge of war,' ' reaffirm faith in fundamental human rights,' establish conditions under which justice…can be maintained, and promote social progress and better standards of life in larger freedom.[50]

The atrocities of the Second World War also emphasized the need for international protection of human rights. There was a need for violations of human rights by persons representing state power (eg Hitler in Nazi Germany), to be seen as breach of international law, and a breach of the duty towards the international community. Only then would the international community step into the states sphere (or what is now known as the domestic jurisdiction of a state) and suggest measures to ensure conformity with international law obligations which human rights forms part.

In 1948 under the aegis of the UN, the General Assembly adopted the Universal Declaration of Human Rights (UDHR).[51] The UDHR formed the basis for the development of international human rights treaties containing a wide spectrum of rights, from the right to life, liberty, food, to the right to be protected from various forms of discrimination, and the right to have a say and share in a country's economic, social and cultural development.[52]

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[49] See article 1 and also articles 55 and 56 of the charter. Human rights are also mentioned in the preamble, articles 8, 13, 62, 67, 68, 73 and 76 of the charter.

[50] Preamble of the UN charter. The formation of the UN in 1945 was a collaborated effort of the Allies of the second world war namely: USA, UK, France, USSR and China who became the five permanent members of the Security Council. During the war, the allies in the Atlantic Charter of 1.1.42 stated that 'complete victory over their enemies is essential to defend life, liberty, independence and religious freedom, and to preserve human rights and justice in their own lands as well as in other lands…' See Ashild Sammoy, ***The Origins of the Universal Declaration of Human Rights*** in G Alfredsson and A. Eide (eds) ***The Universal Declaration of Human Rights*** (1999). Kluwer Law International. Hague. p.3.

[51] Adopted by General Assembly of the UN by Resolution 217 (111) of 10th December 1948.

[52] UDHR together with the 1966 International Covenant on Civil and Political Rights (ICCPR) and the 1966 International Covenant on Economic Social and Cultural Rights

The concept of human rights is broad, covering most aspects of human existence. Therefore for ease of reference several schemes have been used to classify rights, either as basic human rights and freedoms, or 1st, 2nd 3rd generation rights; or individual or collective rights; or civil and political versus economic social and cultural rights. Human rights could also be classified according to the various treaties dealing with a specific issue, either as subjects in need of protection i.e. minorities, indigenous peoples, refugees, women, children, migrant workers etc or according to the elimination of specific forms of discrimination e.g. race, religion, etc or according to an elaboration on certain rights e.g. genocide, torture, treatment of prisoners, or on regional or geographical view point e.g. African, American, European or Asian.

This classification regardless, human rights are universal, indivisible, interdependent and interrelated. The international community must treat human rights globally in a fair and equal manner, on the same footing, and with the same emphasis.[53]

Other characteristics of human rights are that they are inherent in all human beings by virtue of their humanity alone, are inalienable within qualified legal boundaries, are equally applicable to all and are fundamental to life, dignity and other important human values.

Human rights norms differ from other rights in international law in several aspects. Human rights originated from a perceived need to protect the individual against the abuse of power by the state and therefore the primary purpose of human rights is to govern the relationship between the individual and the state, whereas other areas of international law govern the relationship between states. From the preamble of the UDHR; it can be deciphered that human rights form the foundation of freedom, justice and peace in the world, promote social progress and better standards of living and as part of international law are to be implemented in a national context, and they give rise to duties, the responsibility of which lies on the state.

1.6 Intellectual Property Rights (IPRs) as Human Rights

The concept of IPRs as human rights is well entrenched in article 27 of the UDHR[54] and article 15 of the ICESCR.[55] Implicit in these articles is

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(ICESCR) comprise the international Bill of Human Rights. Examples of other international human rights treaties are the 1948 Convention on the prohibition and Punishment of the Crime of Genocide, the 1965 Convention on the Elimination of Discrimination Against Women, the 1989 Convention on the Rights of the Child etc.

[53] Paragraph 5 of the Vienna Declaration and Programme of Action adopted at the 1993 World Conference on Human Rights held in Vienna, Austria A/CONF.157/24.

[54] It states: '1. Everyone has the right freely to participate in the life of the community, to enjoy the arts and to share in scientific advancement and its benefits. 2. Everyone has the

an individual right to IP even though not specifically worded as such.[56] It is therefore sufficient to say that the drafters recognized IPRs as human rights.[57]

IPRs affect other human rights either positively or negatively. In particular TRIPS has created tensions amongst human rights. This tension revolves around balancing IPRs of inventors/creators with the rights of the public.

There is a link between the right of everyone to benefit from the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author (private interests) and the right to participate in cultural life and to enjoy the benefits of scientific progress and its applications (public interests). The rights of the author/creator and the rights of the wider society are seen as complimentary.

Articles 27 of the UDHR and 15 of the ICESCR as such recognize that the rights of authors and creators are not just good in themselves, but are understood as essential preconditions for cultural freedom, participation and scientific progress. As material progress is often the result of scientific progress, it thus implies that everyone must have access to these scientific results and they must not be restricted to a few.

In order to avoid conflicts between the human rights guaranteed by these provisions e.g. IPRs and cultural rights, there is a need to strike the right balance in their promotion and protection. Such striking of balance is at

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right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author.'

[55] It builds on and closely resembles article 27 of the UDHR. It states in part: '1. The state parties to the present convention recognise the right of everyone: a) to take part in cultural life; b) to enjoy the benefits of scientific progress and its applications; c) to benefit from the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author…'

[56] The drafters felt that there was no need to include a specific reference to property in article 27 of the UDHR due to the existence of the right to property in article 17. However, the right to property was omitted in the ICESCR. See Audrey Chapman. ***Approaching Intellectual Property as a human right: Obligations Related to article 15(1)(C) of the International Covenant on Economic Social and Cultural Rights*** -Committee on Economic Social and Cultural Rights. 24th session. Nov-Dec 2000.E/C.12/2000/12. p. 8-9.

[57] While IP as a human right is well entrenched in these Conventions, very little attention has been paid to analyse IP as a human right. A notable exception is indigenous peoples who have called for the recognition of their knowledge as a human right (See article 29 UN Draft Declaration on the Rights of Indigenous Peoples, E/CN.4/Sub.2/1993/29). More efforts have been made to adopt a human rights approach to IP than to recognise IP as a human right. Whether IPRs are viewed as human rights today is also problematic because of the fact that they are in the first place granted by the state rather than recognised by the state. Secondly IPRs exist only for a limited period of time and are territorial as opposed to human rights that are perpetual, inalienable and universal. See Audrey Chapman *op cit.*, p.9 and Peter Drahos. ***Intellectual Property and Human Rights.*** 1999.IPQ.No. 3 Sweet and Maxwell, at p.365-367.

the national level and each state is left with the discretion to find a suitable place, only in line with the minimum standards under the TRIPS Agreement.[58]

States grant limited rights over creations or inventions as a means of providing incentive for innovation eventually ensuring that the public has access to those creations or inventions. Thus, for example under patent law, a state grants an inventor a patent for a limited period of time in return for the inventors disclosure of the invention in his patent application.

During the period of protection, the inventor (now patent holder) has classic property rights e.g. he can exclude others from making, using or selling his patented product. He can also use this time to recoup research and investment costs incurred in the development of his invention and/or otherwise commercially exploit his invention. After the time of protection expires, the invention falls into the public domain and is now freely accessible for all to utilize.

As such in the long run there is no conflict but a mutually supportive relationship between the interests of promoting creativity and innovation (private rights) and maximizing access of the new invention to the wider society (public interest). However during the period of protection there is potential for conflict between the rights of the patent holder and the public because patents come with exclusive rights. The public would not have access to the protected works or inventions except with the authorization of the patent holder.

It therefore remains the challenge for national and international laws to strike a meaningful balance between the rights of authors, creators and inventors (private interest) and the promotion of access to protected works or inventions for the public good (public interest). An emphasis of either one of the interests would tilt the optimal balance that has to be achieved.

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[58] Ragner Adalsteinsson and Pall Thorhalson in G. Alfredsson and A. Eide (eds). ***The Universal Declaration of Human Rights.*** 1999. Kluwer Law International. Hague. p.593. When judging a states fulfilment of these rights, it is relevant to consider the following a) measures taken to ensure the application of scientific progress for the benefit of everyone; b) measures taken to promote the diffusion of information on scientific progress; and c) measures taken to prevent the use of scientific and technical progress for purposes which are contrary to the enjoyment of all human rights. It is observed that the 1993 World Conference on Human Rights held in Vienna, Austria reaffirmed the right of everyone to enjoy the benefits of scientific progress and its applications but noted that certain advances, notably in the biomedical and life sciences as well as information technology may have potential adverse consequences on human rights and called for international cooperation to ensure that human rights are fully respected in light of these scientific advances. See the Vienna Declaration and Programme of Action, adopted on 25th June 1993 at A/Conf.157/23.

On 17th August 2000, the UN Sub-Commission for the Protection and Promotion of Human Rights adopted a resolution unanimously on 'intellectual property and human rights' noting inter alia, that:

'There are actual or potential conflicts that exist between the implementation of TRIPS and the realization of economic, social and cultural rights in relation to, inter alia impediments to the transfer of technology to developing countries, the consequences for the enjoyment of the right to food, of plant varieties and the patenting of genetically modified organisms, 'biopiracy' and the reduction of communities (especially indigenous communities), control over their own genetic and natural resources and cultural values, and restrictions on access to patented pharmaceuticals and the implications for the enjoyment of the right to health.'[59]

The resolution affirms that the right to protection of the moral and material interests resulting from any scientific, literary or artistic production of which one is the author is in accordance with article 27 (2) of the UDHR and article 15(1) (c) of the ICESCR, a human right, subject to limitations in the public interest.[60]

1.7 TRIPS and Human Rights

TRIPS forms part of the WTO Agreement. The overall objectives of the WTO as reflected in the preamble of the WTO Agreement are that member countries' trade and economic relations should be conducted with a view to raising standards of living, ensuring full employment…while allowing for the optimal use of the worlds resources in accordance with the objective of sustainable development, seeking both to protect and preserve the environment and to enhance the means for doing so in a manner consistent with their respective needs and concerns at different levels of economic development.[61]

Article 7 of TRIPS spells out the objectives of the Agreement stating that 'the protection and enforcement of IPRs should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations.

Further it recognizes the need for positive efforts designed to ensure that developing countries and especially least developed countries secure a

[59] Economic and Social Council. *Intellectual Property Rights and Human Rights*. Sub-Commission on Human Rights, Resolution 2000/7. E/CN.4/SUB.2/RES/2000/7.
[60] *ibid* paragraph 1.
[61] See document of the secretariat of the WTO to the Committee on Economic, Social and Cultural Rights. Day of General Discussion, op cit p.2.

share in the growth in international trade commensurate with the needs of their economic development.

The objectives of TRIPS recognize a need for a balance between mutual advantage of producers and users of technological knowledge and a balance of rights and obligations, which corresponds to the attempted balance of rights and tensions inherent between articles 15(1) (a) and 15(1) (b) of the ICESCR, which recognize the right of everyone to take part in cultural life and to enjoy the benefits of scientific progress and its applications and article 15(1) (c) of ICESCR the right of everyone to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author..

TRIPS can also be seen to give effect to IPRS as a human right at the international level as indicated in its preamble that IPRs are private rights.

TRIPS encourages international cooperation by requiring member developed countries to facilitate technology transfer to member least developed countries and to provide, on request technical and financial cooperation to both member developing and least developed countries.[62] International cooperation is also encouraged in international human rights law especially as pertaining to the implementation of economic, social and cultural rights.[63]

TRIPS could also be seen to promote the rule of law at the national and international levels by the observance of due process and the peaceful settlement of disputes through its dispute resolution mechanism.[64]

1.8.1 Understanding the Concept of a Patent

Intellectual property is divided into two main branches; industrial property and copyright. Industrial property seeks to protect the legal rights through patents for the invention, trademarks for the brand identity and designs for shapes while copyright comprises literary, artistic and scientific works. This paper shall draw more attention to patents on GM food.

A patent can be said to be a grant by the government conferring the exclusive right to make, use or sell an invention for a period of time, generally twenty years, from the date of filing the patent. It is a contract between the state and the inventor whereby the latter agrees to disclose and publicize his invention to the society in return for state assurance of protection. As such a patent is said to perform two functions; as an inducement to the inventor on one hand and as an essential factor in

[62] See Article 66(2), 69 of TRIPS.
[63] See Article 2 of ICESCR.

[64] See Part 111 of TRIPS.

scientific and technological progress on the other.[65] Without a doubt, most scientists in today's global economy are engaging in research and development because of patent protection systems, which offer them exclusive rights to work, develop and exploit their inventions.

Recognition of a patent is only after such grant by the state. In the grant of patent rights, it is however important that a balance is struck between private and public interests, that is to say, the rights of the inventor in terms of rewards for patented goods on the one hand and the rights of the general public in terms of access to the patented product on the other hand. Having the balance right is very important for governments especially in the developing world as they work towards becoming TRIPS compliant.[66] The process of granting patents is regulated by legislation in all countries of the world. Most patent offices require that an inventor clearly describe the invention in detail so that a technical person with average skill in that area of specialization is able to carry out the process by carrying out the instructions.[67]It is also important that as patents are granted, their validity is subjected to scrutiny.

1.8.2 Criteria for patentability

For an invention to be patentable, it must satisfy some universally accepted criteria or requirements. First the invention must be ***novel,*** meaning that it must not have been previously known to the public within a given area and it must not have been anticipated anywhere in the world. Novelty may be relative to the former situation or it may be universal. Today in many jurisdictions, universal novelty is the term used. Secondly the invention must be ***non obvious***, i.e. it must contain sufficient innovativeness to merit protection. An invention is considered as involving an innovative step if it is not obvious to a person skilled in the particular art concerned. Thirdly the invention must be ***industrially applicable or useful***.[68] The invention must be useful to the extent that it makes the life of those it is intended for easier by providing practical solutions to problems in that area.

1.8.3 Characteristics of Patents

A patent can be granted for any type of process or product including but not limited to chemicals, drugs, plastics and engines, so long as they meet the above criteria. There are four generally accepted characteristics for patents. The first is ***territoriality.*** In various jurisdictions, the law lays down specific requirements for grant of a patent. As a result such patent is valid only within the territory of such state jurisdiction upon filing.

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[65] **WIPO** ***Intellectual Property and Human Rights***, Geneva, 1998 at p.68.

[66] Medecins Sans Frontiers, ***MSF Campaign for Access to Essential Medicines, Drug Patents under spotlight, p.2. Available at (www.msf.org/content/page.cfm****?),* accessed on 25th October 2005.

[67] WIPO 1998, supra

[68] United Nations, ***Intellectual Property and Foreign Direct Investment,*** New York, 1993, p.5, see also ***WIPO Intellectual Property Handbook: Policy Law and Use****, Geneva, 2001*. p.17-20.

The second characteristic is ***duration.*** It must be mentioned here that patents are of temporary validity because they are limited in time and vary from one invention to another. Currently, 20 years is a generally acceptable duration internationally. After the expiration of such period, the invention falls into the public domain and can be used by the public.

Thirdly, patent rights are ***transferable.*** This means that a patentee can upon following laid down procedure and publicizing the issue for the security of third parties, lawfully transfer his/her patent rights in the invention.

The fourth characteristic is that patent rights are ***exclusive***. This means that the patentee is allowed freedom to work with his/her invention to the exclusion of all others for the period of the patent both within his territory and internationally.[69]

1.8.4 Justifying Patents

It is advanced in argument that patents encourage investment in research and development by providing investors with security that they will be entitled to some part of the flow of benefits that come from any new technology.[70]

Patent systems have a long history and have developed as a way to promote innovation by either importation of new technologies into a country or by making new inventions. There are basically four theories to justify the existence of intellectual property rights. These are: the moral (labor) theory, the personality theory, utilitarian theory[71] and the exchange for secrets theory.[72]

1.8.4.1 The Moral (Labor) Theory

This theory stems from John Locke, who argued that 'every man has property in his own person.'[73] From this he deduced that whatever a man removes out of the state that nature has provided and mixes with his labor becomes his property.[74] In this line of argument, intellectual property seems to follow naturally since the individual must surely be permitted the fruits of his mental as well as physical labor.

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[69] WIPO 1998, *supra* note 6, at p. 70**.**
[70] Julian Morris, Rosalind Mowatt, W Duncan Reekie, Richard Tren**,** ***Ideal Matter: Globalisation and the Intellectual Property Debate,*** Centre for a New Europe, 2002, p.12.
[71] Palmer, T. ***Are Patents and Copyright Morally Justified? The Philosophy of Property Right and Ideal Objects***, Harvard J. Law and Public Policy 13 (3), 1990, p.817.
[72] Anthony D'Amato and Doris Estelle Long**,** ***International Intellectual Property Law,*** **Kluwer Law International, London,** The Hague, Boston, 1997, p. 19.
[73] John Locke**,** ***Two Treatises on Local Government***, Cambridge University press, 1698/1988 at p.287.
[74] *ibid*, p.288.

1.8.4.2 Personality Theory

This theory is derived from the assumption that an individuals personality is intrinsically linked to his thoughts and ideas as they are expressed in external phenomena. Hagel in 1952 in his book 'The philosophy of Right' argued that it is only through the development of his (mans) own body and mind, essentially through his self consciousness' apprehension of itself as free, that he takes possession of himself and becomes his own property and no one else's.[75] This means that a person must be allowed to enjoy the fruits of his/her labor and because of the personal nature of the investment, such fruits are only identifiable with the maker or creator. This is also called private property.

1.8.4.3 Utilitarian Theory

Utilitarian theory assumes that the objective of society should be the attainment of the greatest for the greatest number of people.[76] This is the principle employed by many economists where the outcome of any policy is evaluated in terms of its overall impact on the wealth of society taking into account any externalities that may pertain. This theory is not prescriptive with respect to desirability of IP but rather it calls for empirical evaluation of costs and benefits arising from particular forms of IP.[77] In particular the benefits of stimulating innovation, creativity and reputation building must be weighed against the costs of patent races, monopolistic pricing and innovation suppression.[78]

1.8.4.4 The Exchange for Secrets Theory

This theory presumes a bargain between an inventor and the society whereby the inventor surrenders the possession of secret knowledge in exchange for the protection of a temporary exclusivity in its industrial use. This is based on the presumption that industrial progress is desirable but can only be achieved if inventors reveal their secrets. This theory also tries to prevent over investment by companies in trade secrets to protect their inventions. In order to avoid the social waste that would come from over-investing in trade secrets, the exchange for secrets theory says that the patent protection is an economically efficient alternative.[79]

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[75] *ibid*, p.838.
[76] Julian Morris, *supra*, at p. 19.
[77] *ibid.*
[78] *ibid.*
[79] Anthony D'amato, *supra* at p.19.

Chapter two

2.0 TRIPS, Biotechnology and the Right to Food

In the later part of the 20th century, the world has witnessed the integration of world markets driven by trade liberalization, privatization and the strengthening of IPRs. IP protection untill recently viewed as a subject of a few specialists, has gained a prominent place on the current international economic agenda.[80] The factors contributing to this change and also explaining the new and vigorous attitude of innovating firms and industrialized countries towards the availability and enforcement of IPRs worldwide are: a substantial increase in R&D costs, problems of appropriating the results of innovative activities (particularly new technologies), and the globalization of the economy.[81] Such renewed interesting IP issues have triggered unilateral actions[82] and multilateral negotiations.[83]

Technological advances are intertwined with another phenomenon-globalization, together creating the network age.[84] In the industrial age, raw materials and labor were key resources but today, intellectual commodities like knowledge, scientific discoveries and creative works are the central asset in this knowledge based economy.

2.1 The Beginning of TRIPS

In 1986, during the eighth Round of Multilateral Trade Negotiations under GATT at Punta del Este, Uruguay, developed countries pressed and succeeded in incorporating IPRs, inter alia, in the package of new rules and procedures to conduct international trade.[85]
The conclusion of these negotiations introduced the most comprehensive multilateral agreement that sets out minimum worldwide standards for the protection and enforcement of IPRs, i.e. TRIPS. TRIPS as was earlier reiterated, is one of the agreements annexed to the final Act embodying the results of the Uruguay Round of Multilateral Trade Negotiations under

[80] Transnational Corporations and Management Division. Department of Economic and Social Development. ***Intellectual Property Rights and Foreign Direct Investment***. United Nations, New York. 1993 at p.1.
[81] *ibid.*
[82] For example under the US Trade and Tariffs Act.
[83] Either within WIPO or the Uruguay Round of Multilateral Trade Negotiations.
[84] The network age is characterised by the global information society and is a major historical shift ie from the industrial age, which is rapidly unifying world markets. ***UNDP Human Development Report*** *2001*. 2001. Oxford University Press. New York, at p. 27.
[85] GATT was created in 1947 and provided the basic rules of the multilateral trading system from 1.1.48 until WTO Agreement entered into force on 1.1.95. Its contracting parties met in sessions known as rounds. The main aim of the rounds was to reduce tariffs and other barriers or obstacles to trade so as to enable free international trade. The Uruguay Round included new topics on the agenda for negotiation: such as inter alia, TRIPS.

GATT; it is contained in Annex 1C of the Agreement establishing the WTO. It was adopted in April 1994 and came into force on 1 January 1995.

The introduction of IP issues in the agenda of the Uruguay Round of Multilateral Trade Negotiations was principally an initiative of the USA. The USA first raised IP protection under GATT to clamp down on trade in counterfeit goods and parallel imports.[86] The need to discuss IPRs in these negotiations arose so as to reduce distortions in international trade and the increase in trade in counterfeit goods.

> This issue first emerged in the 1970s and early 1980s when the world went into a severe recession and the USA experienced a dramatic shift in its balance of trade.[87] A worsening balance of trade led the USA to examine structural changes to boost its competitiveness in world trade and the examination revealed that the USA was loosing its technological lead over other industrialized countries, notably Japan and also newly industrializing countries (NICs), notably East Asian countries, mostly due to liberal technology transfer and generally lax import policies.[88]
>
> At this time the US industries mainly in the computer software and microelectronics, entertainment, pharmaceuticals, chemicals and agro-chemical sectors claimed they were suffering heavy losses from the absence of adequate protection of their IPRs abroad.[89] They were concerned about the loss of commercial opportunities abroad-brought about by the failure of foreign countries to recognize their IPRs based on US IP law which was different from or non existent in those countries-and thus a loss to the US economy.[90] In 1987, a survey by the US International Trade Commission (ITC) confirmed on the basis of public hearings held and questionnaires administered, that firms in the US were loosing some US$43-61 billion annually, owing to lack of IP protection abroad.[91]
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> The non-recognition of IPRs granted in the USA meant that NICs would be in a position to imitate new technologies.[92] The result was the

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[86] Rohini Acharya. ***Intellectual Property, Biotechnology and Trade: The Impact of the Uruguay Round on Biodiversity.*** African Centre for Technology Studies.(ACTS). ACTS Press, Bio policy International Series No. 4. Nairobi. Kenya at p.7.

[87] *ibid.* It is estimated that in the 1980s, the trade deficit of the US was $150 billion. See Vandana Shiva, *op cit* at p. 19.

[88] *ibid.*

[89] Adede, A. O. ***The Political Economy of the TRIPS Agreemnt: Origins and History of Negotiations. 2001. African Centre for tEchnology Studies (ACTS). Biopolicy International Series No. 24. Nairobi Kenya at p.2.***

[90] Vandana Shiva, *op cit,* at p. 19 and Rohini Acharya, *op cit* at p.8.

[91] Adede, *op cit,* p.2 and Vandana Shiva, *op cit* p.19.

[92] In the 1980s, counterfeiting (and copyright piracy) increased in the developing countries because of the desire of these countries to catch up in the industrialisation process and also to have access to printed educational material, which they needed. The situation was accelerated by various factors namely; the advent of copy prone electronic based technologies and products; the growing competitiveness of NICs in the manufacturing sector, the increasing globalisation of the market place and the growing perception of IP by

production and export of counterfeit goods from NICs, which are cheaper than the IP protected counterparts from the industrialized countries. The NICs while closing their markets to exports from the US would gain access to the US market as a result of the liberal trade practices in the US.[93] The increasing competitiveness of the NICs threatened the supremacy of US business as a result of increasing imitation of IP protected goods.[94] Thus to reverse this trend, a need to counter such unfair trade practices of NICs was identified.

At the multilateral level, the enforcement of IP protection under WIPO was very weak or nonexistent. During the Uruguay Round of Multilateral Trade Negotiations, the USA pointed out the failure of conferences in 1980-1984 to revise the Paris Convention to address these issues, and therefore preferred the GATT forum for negotiating effective enforcement of IPRs at the international level.[95] The USA stated that the GATT forum provided for effective enforcement of agreements and for dispute settlement mechanisms, which were practically lacking in the WIPO administered conventions. The USA continued with its efforts to introduce in the GATT forum the protection of IPRs to address the problem of counterfeit products and later of copyright piracy, which had been increasing in the developing countries in the 1980s.[96]

At the Uruguay negotiations, the debate on inclusion of IPRs under GATT pitted developed and developing countries against each other mainly due to different priorities faced by these two groups of countries.[97] Developed countries favored the IPRs debate under GATT so as to clampdown on trade in counterfeit goods which was undermining their own industrial production while developing countries were concerned about the implications of this for technology transfer and technological development of their countries.[98]

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the enterprises of the developed countries as a strategic asset. There was thus a tension between the quest for tighter protection of IPRs for the promotion of creativity being pursued by the industrialised owners of the property and the policy of maximisation of social welfare arising from an impeded diffusion of that creativity, being pursued by developing countries, through more relaxed IPRs protection. See Adede, *op cit*, p.4.

[93] *ibid.*

[94] *ibid.*

[95] See Adede, *op cit*, p.3 and Rohini Acharya, *op cit* p. 10.

[96] It is observed that US business was the main driving force behind the insistence by the US government to include IPRs in the GATT forum, notably through the Intellectual Property Committee (IPC) of USA, and also industry associations of Japan (Keidanren) and Europe(UNICE). IPC is a coalition of thirteen major US corporations ie Bristol Myers, Dupont, General Electric, General Motors, Hewlett Packard, IBM, Johnson and Johnson, Merck, Monsato, Pfizer, Rockwell and Warner. See Vandana Shiva, *op cit*, p.94-98.

[97] Rohini, Acharya, *op cit* p.10.

[98] *ibid.* Developing countries saw the establishment of an international IPRs system under GATT as likely to be detrimental to their economic growth and development. Developed countries are largely the ones who develop new technologies and therefore, developing countries saw the introduction of IPRs under a trade forum such as GATT as a barrier for them to gain access to these new technologies or be able to develop imitations of their own. See Rohini Acharya, *op cit*, p.10.

Developing countries saw the concern being raised by the developed countries, particularly the USA as being expressed on behalf of US industries. They saw all efforts towards the establishment of an effective regime for the protection of IPRs as aimed at furthering the interests of western-based industries and not those of developing countries. Indeed the US pharmaceutical industry was already leading in the effort to link the protection of IPRs to trade.[99]

Developing countries thus resisted the idea of making the issue of IPRs protection a subject for discussion under the Multilateral Trade Negotiations because of such strong industry influence and specific agenda. They saw IP as an issue exclusively within the competence of WIPO. The EC also did not, at least at the beginning, endorse the link between IP to the negotiations under the GATT forum. However, later together with USA, they attempted to introduce an Anti-Counterfeit Code(ACC) at the Tokyo Round of Negotiations but the Code was never adopted.[100]

The USA did succeed in including the protection of IPRs in the agenda of the Multilateral Trade Negotiations, even beyond the question of counterfeiting and piracy, to include substantive minimum IP protection standards to be adopted by all negotiating countries but this did not reduce the reluctance of the developing countries towards such inclusion.

2.2 Changing of minds towards TRIPS by the Developing Countries

One of the arguments advanced for the inclusion of IPRs within the GATT forum and not WIPO was that; under the GATT forum, developing countries may have the opportunity to use a bargaining power and secure trade-offs in negotiating favorable terms on issues such as textiles and clothing, agriculture, tropical products, and safeguards, as part of the package that included IPRs. The consideration of such trade issues clearly went beyond the limited discussion on whether or not to establish high standards for the protection of IPRs, as would be the case of negotiations within the framework of WIPO.[101] Thus the Round of Multilateral Negotiations was seen as providing a unique opportunity for developing countries to achieve tangible gains by expanding the scope of issues for discussion.

This argument on possible useful trade-offs in the results of the negotiations encouraged developing countries to assess more closely the positive and negative elements associated with their continued rejection of the inclusion

[99] In 1984, Edmund T Pratt, Chairman of the Pfizer Corporation initiated the process by saying: 'We must also work to get more broadly based economic organisations, such as the OECD and the GATT, to develop intellectual property rules, because intellectual property protection is essential for the continued development of international trade and investment.' See Adede, *op cit*, p.3.
[100] *ibid*, p.4.
[101] Adede, *op cit.*, p.5.

of IPRs in the Uruguay Round. A further consideration of the possible package-deal helped some developing countries warm up to the idea of inclusion of TRIPs on the Uruguay Round agenda. But they still adopted a restrictive approach because firstly, they wanted WIPO to remain as the only organisation with the competence over substantive standard setting for IPRs; secondly, they wanted to limit the negotiations under the mandate to counterfeit and strictly trade related issues; thirdly, they stressed the importance of transfer of technology and development policies as a quid pro quo for IP protection.[102]

With intensive lobbying and discussions, the actual agreement to take TRIPS up for discussion began in 1989 by the Trade Negotiating Committee (TNC).[103] It thus took three years between the discussion to include TRIPS in the Uruguay Round in 1986 and the actual agreement to take it up for discussion in 1989.

The discussion of TRIPS began with a number of legal texts prepared, first in March 1990 by the members of the EC.[104] The submission of a complete text by the EC was an important phase of the negotiations, bearing in mind the earlier doubts. The USA, Switzerland and Japan also submitted drafts all of which borrowed substantially from the EC text.[105]

Later in addition to the above drafts, a group of twelve developing countries agreed to participate in the actual negotiations on TRIPS by producing their own detailed proposal.[106] By presenting their proposal, the developing countries wanted to signal first their determination to emphasize the part dealing with trade in counterfeit while minimizing the part relating to substantive standards on IPRs, second, they wanted to highlight the importance of the public policy objectives underlying national IPR systems, the necessity of recognizing those objectives at the international level and the need to specify some basic principles e.g. national treatment, which could subsequently elucidate the application of any standards established in the TRIPS. Third, they insisted on the need to respect and safeguard national legal systems and traditions on IPRs in view of the diverse needs and levels of development of states participating in the IPR negotiations.

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[102] *ibid.*

[103] In 1988, during the Ministerial meeting held in Montreal, Canada, the trade ministers failed to agree on the commencement of negotiations of , inter alia TRIPS. They then decided that the TNC should meet in Geneva in April 1999 to continue discussions and agree upon the remaining areas and review the entire package. The pressure was to be applied upon the so called big developing countries to abandon their resistance. See *ibid,* p.6.

[104] Adede, *op cit* p.8.

[105] *ibid.*

[106] *ibid*. These countries were: Argentina, Brazil, Chile, Colombia, Cuba, Egypt, India, Nigeria, Peru, Tanzania and Uruguay and later joined by Pakistan and Zimbabwe.

2.3 The Final Draft of TRIPS

Indeed TRIPS has revolutionalized IP protection systems for a number of reasons. First it imposes a minimum IPRs standard for all WTO members.[107] This standard is derived from the laws of industrialized countries, applying the form and level of protection of the industrialized world to all WTO members. Although TRIPS has attempted to harmonize national IP standards, these standards are far too high for many developing countries, including those in Africa.[108] WTO members must ensure that their laws meet the minimum standards laid down but they can introduce more stringent laws if they wished.[109]

TRIPs provides for an effective IP protection enforcement mechanism through the integrated dispute settlement system.[110] A serious threate in this system is that if a country does not fulfill its IPRs obligations under it, trade sanctions can be imposed against it. TRIPS also includes for the first time in any area of international law, rules on domestic enforcement procedures and remedies.[111]

Third, TRIPS has expanded the scope of IP by extending the scope of protectable subject matter.[112] Also TRIPS allows for the first time, the patenting of life forms and processes e.g. micro-organisms, microbiological processes and plant varieties under article 27(3)(b).

Fourthly, TRIPS has also strengthened the level of IP protection and thereby strengthened the legal position of IPRs holders. The strengthening of IPRs under TRIPS raises the price of technology transfer or access to new technologies and further increases the risk of blocking developing countries out of the technology sector. This is because as a property right, IPRs holders can dictate the terms on which third parties can access their

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[107] See article 1 of TRIPS.

[108] The IP standard laid down in TRIPS is very high compared to existing laws in most developing countries, including those in Africa. Although developing and least developed countries have flexible schedules to implement TRIPS at the national level, the IP standards TRIPS imposes often conflict with these countries national interests and needs.

[109] See article 1 of TRIPS.

[110] See part V of TRIPS and article 68 of TRIPS. The Council for TRIPS is required to monitor members' compliance with their obligations under TRIPS. IPRs disputes are subject to WTO's dispute settlement procedure. In the case of a dispute, a panel of specially appointed trade experts hears the dispute. The decision of the panel may be subject to appeal to the WTO Appellate body. If a party to a dispute fails to abide by such decision, the other party can impose trade sanctions on the member in breach upon authorisation by the Dispute Settlement body. See Audrey Chapman, *op cit* p.6 and *Report of the United Nations High Commissioner for Human rights: The Impact of the Agreement on Trade Related Aspects of Intellectual Property Rights on Human Rights.* Sub Commission on the Promotion and Protection of Human Rights. 52nd session. E/CN.4/Sub.2/2001/13. p.3-4.

[111]Tansey Geoff *Trade, Intellectual Property, Food and Biodiversity:* Key issues and options for the 1999 review of article 27.3(b) of TRIPS provides inter alia that patents shall be available for any inventions, whether products or processes, in all fields of technology.

[112] Article 27(1) of TRIPS provides inter alia that patents shall be available for any inventions, whether products or processes in all fields of technology.

technologies eg through the payment of royalties and therefore the highest bidder gets the license to the technology. This is particularly true with respect to modern technologies that have been developed by MNCs where heavy investments have been put into their R&D and therefore by obtaining IPRs, such MNCs would like to get a return for their investment plus profit.

TRIPS, as adopted is as a result of intense negotiations and compromise between different sets of interests. TRIPS covers copyright, and related rights, trademarks, geographical indications, industrial designs, patents, plant variety protection (PVP) layout-designs (topographies) of integrated circuits, protection of undisclosed information/trade secrets and control of anti-competitive practices in contractual licenses.[113] Of these, patents, PVPs and trade secrets are particularly relevant to food and agriculture.

2.4 TRIPS and Patents for New Life Forms

Section 5 of part 11 of TRIPS on patents was the most politically and economically controversial in the entire TRIPS Agreement.

Articles 27(2) and 27(3) are said to draw from article 52 and article 53 of the 1973 European Patent Convention (EPC).[114] The latter entrenches a morality criterion as part of the restrictions on patentability and the former stipulates that European patents shall not be granted in respect of plant or animal varieties or essentially biological processes for the production of plants and animals (with the exception of microbiological processes and the products thereof).[115]

The key element is the mandatory requirement for WTO members to make patents available for any inventions, whether products or processes in all fields of technology without discrimination.[116] It is said that one reason for

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[113] See part 11 of TRIPS that deals with 'Standards concerning the Availability, Scope and Use of IPRs.'

[114] The EPC is founded on the provisions of the 1963 Strasbourg Convention and also UPOV. See Li Westerlund, *op cit*, p 4-5.

[115] Although the EPC provisions indicate restrictions to patentability, European Patent Office (EPO) case law has been progressively narrowing the restrictions eg the patentability of the Harvard **'onco'** mouse was initially rejected by the EPO on morality grounds. The EPO Technical Board later reversed this decision. See paper presented by Peter Drahos on *the TRIPS Review, supra,*. Further, in light of recent developments in biotechnology, the protection of biotechnological inventions in the EU has expanded to now include biological material and processes, isolated from the natural environments or produced by means of a technical process as the subject of an invention even if it previously occurred in nature, by the coming into force of the EC directive on the Legal Protection of Biotechnological Inventions. See EC Directive 98/44/EC of the European Parliament and Council of the EU of 6.7.98. Available at (www.wipo.int/WIPO/GRTKF/IC/1/8), accessed on 20th June 2004.

[116] Article 27 (1) of TRIPS. As a political matter in the negotiations, this was especially meant to cover pharmaceuticals, which had been excluded from product patent coverage in many developing countries. See Barton, J. Biotechnology and TRIPS: Issues and Options for Developing Countries. 2000. Graduate Institute of International Studies. PSIO Occasional paper. WTO Series. Number 03. Geneva. p.12.

the greater interest in patents is the rapid development of biotechnology, especially in the developed countries, and its application in agriculture.[117]

However WTO members are allowed certain exceptions to the basic rule on patentability:

Article 27(2) of TRIPS provides that members may exclude from patentability inventions, when they want to prevent the commercial exploitation of the invention to protect *ordre public*[118]*or morality; including to protect human, animal or plant life or health or to avoid serious prejudice to the environment.*

Article 27(3)(a) provides that members may exclude from patentability diagnostic, therapeutic and surgical methods for the treatment of humans or animals.

Article 30 provides members with limited exceptions to the exclusive rights conferred by a patent, *provided that such exceptions do not unreasonably conflict with a normal exploitation of the patent and do not unreasonably prejudice the legitimate interests of the patent owner, taking account of the legitimate interests of third parties.*

Article 27(3)(b) of TRIPS is of special interest. It states:

Members may also exclude from patentability;
b) plants and animals other than micro-organisms, and essentially biological processes for the production of plants and animals other than non-biological and micro-biological processes. However, members shall provide for the protection of plant varieties either by patents or by an effective sui generic system or by any combination thereof. The provisions of this sub paragraph shall be reviewed four years after the date of entry into force of the WTO Agreement.

The key terms used in article 27(3)(b) are not defined in TRIPS i.e. plants, animals, microorganisms, essentially biological processes, non biological, micro biological, plant varieties,[119] effective and sui generis[120]system. It is noted that these words are defined differently in different national and

[117] Biotechnology is not a new science. For example methods of making bread, beer, wine or cheese using yeast have been known and used since time immemorial. Article 2 of the CBD defines biotechnology as any means of technological application that uses biological systems, living organisms, or derivatives thereof to make or modify products or processes for specific use.
[118] Ordre public concerns the fundaments from which one cannot derogate without endangering the institutions of a given society. Morality is a different concept See Geoff Tansey, *op cit*, p.25.
[119] The question arises how a plant variety can be distinguished from a plant and whether a transgenic/genetic engineered plant is a plant or a plant variety
[120] Sui generic is a Latin term meaning 'one of its kind.' In this context, it could mean a system of rights providing an alternative unique form of IP protection designed to fit a country's particular context and needs. It can have a wider meaning to cover IP not covered under TRIPS or a system protecting community, farmers' and indigenous peoples' rights.

international laws. This would mean that there is considerable scope of individual national interpretations to be put to them and protracted legal wrangles are likely to determine which interpretation prevails.[121]

It is stated that in order to comply with article 27(3)(b) of TRIPS, four options are available:
1.To allow patents on everything, and therefore not take up the option to exclude plants, animals and essentially biological processes.

2.To exclude plants, animals and essentially biological processes from patenting but not to exclude plant varieties from patentability.

3. To exclude plants, animals and essentially biological processes from patenting and introduce a sui generis system for the protection of plant varieties.

4.To exclude plants, animals and essentially biological processes from patenting but not plant varieties and to provide in addition, for a sui generic system (combination thereof).[122]

The bottom line is that plant varieties at the very least have to be protected. Options 1 and 2 would not require members to establish a sui generic system to protect plant varieties.

Our analysis will be limited to patents and PBRs on plant varieties because of the requirement to provide some form of IPRs for plant varieties if WTO members exempt plants, animals and non biological processes for their production from patentability. It should be noted however that there is biotech animal research going on with many patents being taken out in this area. Eg Harvard's 'onco mouse' or 'Dolly' the sheep, which could have implications in animal research and breeding.[123]

As earlier mentioned, to be eligible for a patent, an invention must be new, involve an inventive step (non obvious) and be capable of industrial application (useful).[124]

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[121] Geof Tansey, *op cit*, p.7. It has also been said that this provision provides sufficient flexibility for countries to design a system that best suits their circumstances and meet the goals and objectives. See International Plant Genetic Resources Institute. *Key Questions for Decission-Makers: Protection of Plant Varieties under the WTO Agreement on Trade Related Aspects of Intellectual Property Rights.* October 1999. Available at (www.ipgri.org), accessed on 31st October 2004.
[122] Geoff Tansey, *op cit*, p. 7-8.
[123] In 1984 research scientists at Harvard University, USA inserted a human cancer gene in a mouse and obtained a US patent on the genetically engineered mouse 'onco mouse' which is said to be susceptible to cancers. The patent is for the biotech process used to create the onco mouse or when used in other mammals and the mouse itself. Also in 1995, research scientists at the Roslin Institute in Edinburgh, Scotland created 'Dolly' a sheep by a genetically engineered process known as cloning.
[124] Article 27(1)(b) of TRIPS. The concept of invention as used in patent law means a technical solution to a problem. Novelty is the state of the art comprising everything made available anywhere to the public by means of written or oral description, by use, or in any

Traditionally, new life forms as products of nature, laws of nature or scientific principles were not patentable as they were considered to be discoveries. Particularly when it comes to plant varieties, it is often difficult to fulfill the criteria of inventiveness. It will also be difficult to deliver a written description of how to make and use the new plant variety, which is also required in order to get protection through a patent. Article 27(3)(b) of TRIPS has changed all this as the distinction between discovery and invention has been blurred.

Consequently, article 27(3) (b) inadvertently relegates new plant varieties to protection through a sui generis system. However this one remains undefined in TRIPS only, article 27 emphasizes that such sui generis system must be effective, but even then what constitutes effective is not given in TRIPS. However, long before the TRIPS Agreement there was in existence as early as 1961 the UPOV system of plant breeders rights.[125]

2.5 TRIPS and Agricultural Biotechnology

Traditionally, biology was considered outside the scope of technology, as man could not control it in a predictable way. Technology strictly speaking involves human control. Thus processes that may be entirely controlled by man in a scientific way, or products which are made by man according to scientific principles, involve the use of technology. Recently as a result of scientific discoveries, it has become possible to develop biological processes, which manipulate living organisms. These processes may be entirely controlled by man e.g. genetic engineering-the artificial modification of genes which changes the material determining the hereditary characteristics of living organisms (DNA) and thus it is possible to create modified organisms that have certain desirable features.[126]

Agricultural biotechnology has been known and used for centuries. Over the years, the improvements made in crops e.g. productivity, pest and disease resistance have been achieved either through conventional plant breeding or local/farmers selection using their traditional agricultural knowledge geared towards maintaining agro-biodiversity in their eco systems. In the 1960s, the 'green revolution' increased agricultural productivity in Asia and Latin America through the introduction of high yielding rice and maize varieties.

The work of Louis Pasteur on yeast fermentation and Gregor Mendel on genetics, in the late 19th century to the early 20th century ushered in the current era of modern biotechnology. Modern biotechnology is

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other way before the date of filing of the patent application.' Inventive step is 'not obvious, having regard to the state of the art, to a person skilled in the art.' See Geoff Tansey, *op cit*, p.25.

[125] UPOV stands for the International Union for the Protection of new Varieties of Plants. An in depth discussion of UPOV is at p.57

[126] See New Developments in Intellectual Property in *Background Reading Material on Intellectual Property. 1988. WIPO Publication.p.375-376.*

characterized by a range of cutting-edge techniques or applications that use living organisms or substances from those animals to develop microorganisms to make or modify a product, to change the characteristics of plants or animals or to develop microorganisms for specific purposes. It includes cell fusion, tissue culture, in-vitro fertilization, selection makers, gene transfer, cloning and promoter technology.[127] It also includes genetic engineering-the process of recombining/altering DNA.[128] Genetic engineering involves the use of molecular techniques both to identify and move genes from one cell to another (even across species)- as opposed to reproductive/sexual means-to produce genetically modified organisms (GMOs).

There have been substantial improvements in molecular science and reproductive biology ushering in a new understanding of genetics. Modern science is now unraveling the structure of genomes and discovering the characteristics and functions of individual genes. Modern agricultural biotechnology is characterized by the ability to manipulate genes and has brought to the forefront the importance of genetic resources. These new technologies have made a link between genes and new plant varieties while sparking many debates about the limits of science and the ethics of tampering with the essence of life.

Life forms or products of nature are now patentable subject matter, when some human intervention has been necessary to make them available or where man has given that life form something it did not have naturally.[129] Thus if it is possible to control a biotechnological product or process and to describe it in a way that experts in that field can carry it out on the basis of the description made, then a biotechnological invention has been made and can be the subject of a patent.

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[127] *ibid*, p.2-8.

[128] DNA is the molecule in chromosomes that is the repository of genetic information in all living organisms, with the exception of a small number of viruses in which the hereditary material is ribonucleic acid RNA, As its coded information determines the structure and function of an organism, directly or indirectly the DNA controls the production and reproduction of the cell, organ and plant or animal. See Li Westerlund, *op cit*, p.7-8.

[129] The eligibility of life forms as patentable subject matter(as a point of law is now settled in light of the EC Directive, EPO case law and US case law. The US Supreme Court decission in ***Diamond, Commisioner of Patents and Trademarks vs Chakrabarty, 447 US 303(1980)*** addresses the scope of patentable subject matter stating that *'anything under the sun that is made by man'* is patentable. The respondent filed a patent application relating to his invention of a human made genetically engineered bacterium capable of breaking down crude oil (absorbs oil from oceans and rivers), a property not possessed by no naturally occurring bacterium. Initially, the application was rejected because living things are not patentable subject matter. On appeal, the Supreme Court stated that an artificially created life form-the new form of bacterium obtained by genetic engineering-is patentable subject matter. By virtue of this decision, the USPTO began to issue different types of patents protecting biotechnological methods of breeding and biotechnologically produced plants. In addition, USPTO has also interpreted this decision to mean that any plant can be patented, provided it satisfies the conditions on patentability. However the patenting of life forms is still contested on ethical, cultural and religious grounds. See Fredderick Abbot et al, *op cit*, p.28-42.

The advent of modern biotechnology, particularly genetic engineering is a major driving force in the expansion of protectable subject matter, to now include life forms. Big and powerful corporate interests are behind this expansion of protectable subject matter to cover life forms.[130]

In plants, patents may apply to various biological materials and processes, including:
1.DNA sequences that code for a certain protein
2.Isolated or purified proteins
3.Seeds
4.Plant cells and plants
5.Plant varieties, including parent lines
6.Hybrids
7.Processes to genetically modify plants and
8.Processes to obtain hybrids.[131]

Arguably, patenting of genes at the cell level extends the scope of protection to all plants, which include a cell with the patented gene. However patenting principles and practices on biotechnological inventions are still in a state of flux, including in those countries that have experience in the patenting of genes.[132] What is relatively clear is that biotech patents are being aggressively enforced and are being used to establish a competitive advantage in the market place.

2.5.1 Plant Breeders Rights (PBRs)

As noted above, article 27(3)(b) of TRIPS states that plant varieties may be protected under a sui generic system.[133] A sui generic system likely to be recognized (particularly by developing countries) as effective is the UPOV system of PBRs.[134] UPOV aims to encourage the development of plant varieties with the promotion of an effective system of plant variety protection. This is a powerful tool in an effort to enhance food production in a sustainable way. The UPOV Convention known after the French acronym 'Union Internationale pour la Protection des Obtentions Vegetales'[135] was

[130] One of the economic reasons for patenting life is that living organisms can reproduce themselves after they have been sold. This limits the potential profitability of biological inventions but patents on these inventions are an option for MNCs seeking to protect the profits that these inventions promise.
[131] Geoff Tansey, *op cit*, p.8. For a more comprehensive analysis see Carlos Correa, *op cit*. p. 173-183.
[132] Carlos Correa, *op cit*, p.187.
[133] TRIPS does not offer any definition as to what this system is. It is left to individual countries to determine what an effective sui generic system is to protect new plant varieties with some form of IPRs.
[134] Although not even mentioned in TRIPS, African countries are being pressurized or being forced to join UPOV so as to meet their obligations. The lack of definitions in TRIPS is thus leading to the manipulation of sovereign states. See Adede, *op cit* p. 17-18.
[135] UPOV establishes the International Union for the Protection of New Varieties of Plants, an intergovernmental organization with its headquarters in Geneva, Switzerland, UPOV was adopted in 1961, entered into force in 1968, and has subsequently been revised in

initially developed in Europe and has now been adopted by industrialized countries and an increasing number of developing countries. It ensures that its member states acknowledge the achievements of breeders of new plants by making available to them an exclusive property right on the basis of a set of uniform and clearly defined standards. Most of UPOV contracting states account for the largest part of the global seed trade.

PBRs were developed as an alternative to patents to grant plant varieties protection because plant breeders found it impossible to meet the conditions for patentability i.e. inventiveness (non obvious) and the disclosure requirement of how to make and use the invention. This was largely attributable to the fact that life forms were excluded in their purely natural state from patent protection.

PBRs are exclusive property rights for a limited period of time at the end of which the varieties protected by them pass to the public domain. The rights are also subject to controls, in the public interest against any possible abuse.[136]

PBRs are given by a state as an incentive to its breeders for continued or increased investment to pursue innovation for the creation of new plant varieties. This is because breeding is long term and expensive and once plant varieties are released they are easily copied. PBRs also safeguard the interests of breeders by recognizing their moral rights in innovation and their economic right to remuneration.

To be eligible for protection, a plant variety has to be:

1.Distinct (clearly distinguishable from existing commonly known varieties)

2.Uniform (sufficiently uniform in its essential characteristics with variation as limited as necessary to permit accurate description and assessment of distinctness and to ensure stability)
3.Stable (in its essential characteristics over time which remain unchanged after repeated propagation) and

4.New (it must not have been offered for sale or marketed prior to certain dates established by reference to the date of the application for protection).

The 1978 and 1991 UPOV Acts set out a minimum scope of protection and offer member states the possibility of taking national circumstances into account. Under the 1978 Act, the minimum scope of protection of PBRs requires that the right holder's prior authorization is necessary for production for purposes of commercial marketing, the offering for sale and

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1972, 1978 and 1991. See (www.upov.int) for the role and functions of UPOV and other particulars.

[136] Article 30 (1978 UPOV Act) and Article 30(1991 UPOV Act) allow for the restriction on the free exercise of the exclusive rights for reasons of public interest and subject to ensuring that the breeder receives equitable remuneration.

the marketing of propagating material (e.g. seeds) of the protected variety. The 1991 Act contains more detailed (and stronger) provisions as explained below.

The 1991 Act tilts PBRs more towards patents and is geared to institutional breeding that may not suit all countries.[137] This Act sought to maintain the effectiveness of breeders' rights in the face of new biotechnologies such as genetic engineering. This led to the introduction of stronger terms, which are the only terms under which new members may join.

A key addition in the 1991 Act was designed to prevent genetic engineers from adding single genes to existing varieties and exploiting the modified variety with no recognition of the contribution of the breeder of the existing variety. Such modified varieties are now seen as 'essentially derived' varieties and may not be exploited without the consent of the original breeder.

Other notable changes are:[138]

1.It extends the subject matter of protection from plant varieties of nationally defined species to all plant genera and species;

2. It has extended the scope of the breeders right by expanding the acts subject to the breeders consent in respect to the propagating material of the protected variety. This not only includes production, marketing and final sale but also reproduction (multiplication) conditioning for the purpose of propagation, exporting, importing and stocking for those purposes.[139]

3 The farmers' privilege in the 1978 Act is further limited in the 1991 Act. It leaves member states to determine on an optional basis whether or not to exempt from the breeders' right any traditional form of saving seed, for use as seed in subsequent planting seasons;

4.Fourth it provides that PBRs may be extended to the products made directly from harvested materials in cases where the breeder did not have reasonable opportunity to exercise his right on the propagating material of the variety.

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[137] See Geoff Tansey, *op cit* p. 8-11, e.g. the concept of national treatment, the provision of appropriate legal remedies for the enforcement of rights.

[138] See Girsberger, M.A. ***The Protection of Traditional Plant Genetic Resources for Food and Agriculture and the Related Know-How by Intellectual Property Rights in International Law-The Current Legal Environment. The Journal of World Intellectual Property. Vol.1. No. 6 November 1998. Werner Publishing Co. Ltd. Geneva, p.1029-1032.*** See also Intellectual Property Rights and Foreign Direct Investment *op cit*, p.18-19.

[139] Article 5(1978 UPOV Act) lists down the acts that require the authorization of the breeder (1) the act of production for the purposes of commercial marketing, (2) the act of offering for sale; and(3) the act of marketing. In addition to these acts, Article 14(1991 UPOV Act) introduces (1) the act of reproduction or multiplication; (2) the act of conditioning for the purpose of propagation; (3) the act of exporting; (4) the act of importing; (5) the act of stocking for any of these purposes.

5.The 1978 Act further provides for the breeders exemption allowing breeders to use a protected variety as an initial source to create their own variety and then market them.

The 1991 Act also includes this exemption but adds that 'essentially derived' varieties can only be marketed with the consent of the original breeder.

6.It removes the restriction of the 1978 Act, which prohibited the accumulation of patents and PBRs.[140]

7.It extends the minimum period of protection from fifteen years to twenty years and to twenty-five years for trees and vines.

2.5.2 The Combination Option

A mixed system of patents and a sui generic system is also envisaged under TRIPS, which would provide the strongest IPRs regime as this allows both types of IPRs to be used. It is also of the most advantage to developed countries with modern biotechnological industries. It is unclear whether this provides for double protection i.e. whether patents and a sui generic system can protect an object or that every object must be covered by either system.

2.5.3 Undisclosed Information/Trade Secrets

TRIPS, requires trade secrets to benefit from IP protection. Trade secrets are protected against dishonest commercial practices e.g. unfair competition.
Article 39 of TRIPS provides that the protection applies to information that is:

1.Within the control of the holder
2.The control must have been lawfully obtained
3.The acts of disclosure, acquirement and use of the information by others, must take place without the consent of the holder of the information;
4. These acts must take place in a manner contrary to honest business practices;
5.The information must be secret;
6.The information has commercial value because it is secret.
7.The person lawfully in control of the information must have taken the steps reasonable under the circumstances to keep the information secret.

TRIPS does not require trade secrets to be treated as a form of property but it does require that a person lawfully in control of such information must have the possibility of preventing it from being disclosed to, acquired by, or

[140] Under the 1978 UPOV Act, a member state whose national law allows protection under both these forms may provide only one of them (and not both) for one and the same species. It thus restricts the state to protect breeders rights either by patents or PBRs and not both.

used by others without the consent in a manner contrary to honest commercial practices. Manner ‘contrary to honest commercial practices’ includes breach of contract, breach of confidence, as well as the acquisition of trade secrets by third parties who knew or were grossly negligent in failing to know, that such practices were involved in the acquisition.

Therefore to benefit from trade secret protection, information (which can include genetic material) must derive independent economic value from not being generally known and must be the subject of efforts that are reasonable under the circumstances to maintain its secrecy. The effective term of protection is as long as the secret is valuable and secret and thus is not subject to a fixed term.

Trade secrets have been used to control inbred lines used as parents of a hybrid. As the inbred lines are kept secret this does not affect the marketing of the hybrid. The lines can be protected through a combination of efforts such as the physical protection of the materials themselves and of the contracts with employees and those involved in producing seeds.

Chapter Three

3.0 The Concept of Genetically Modified Food, Understanding what it means:

Many times, people mix up genetically modified food and synthetic foods.[141] This fallacy is common in both the developed and developing worlds, among the elite and non elite, save for those who bother to find out more about the concept either through research or specialised education and it needs to be demystified. However, the confusion is understandable for the concept is not that plain to the eye and neither is it eye catching even though it essentially deals with food,which we all need for our life survival.

3.1 Distinguishing genetic modification from Hybridization

GM foods are different from hybridizations which work harmoniously with superficial aspects of nature without fully disturbing the essential life force at the centre of each cell.[142] With hybridization conscious life makes primary genetic decisions. This may best be understood in a cynical analogy: there is an immense difference between being a matchmaker and inviting two people for dinner, encouraging them to go on a date as opposed to forcing the union or even a date rape.[143] Synthetic production of food-stuff is a form of hybridization and does not change the cell structure, thus distinguishable from genetic modification.

3.2 Biotechnology: The historical development

Biotechnology is the name that has been given to a very wide range of agricultural, industrial and medical technologies that make use of living organisms for example microbes, plants or animals or parts of living organisms for example isolated cells or proteins to provide new products and services.[144] The new products or services are usually called new life forms.

> The origins of biotechnology lie in the ancient crafts of brewing, baking and the production of fermented food such as yoghurt and cheese. It was not until 1859 that microbes were identified as the cause of both desirable and undesirable changes in food.[145] Louis Pasteur[146]provided a

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[141]In my view, and from discussions with people from different parts of the world, many lack the knowledge and understanding of genetically modified food and naively believe that synthetic food in the supermarkets and shops is genetically modified food. This paper therefore is intended to create a better understanding of the concept.

[142]National Centre for Biotechnology Education guide :"***The Technology-Genetically Modified Food***" Available at (www.ncbe.reading.ac.uk/NCBE/GMFOOD/technology), accessed on 2/2/2004.

[143] i*bid*, p.7.

[144] *ibid*, p.1.

[145] *ibid*.

scientific understanding of these natural processes, which helped to improve the reliability of traditional fermentations and ensure the safe preservation of food and drink.

Pasteur thought that microbes were always needed to bring about changes, which occur during fermentation. Towards the end of the 19th century however, it was realised that non-living extracts from for example yeast cells could also cause changes that are normally associated with activities of whole organisms.[147] These extracts were named enzymes, and we now know that all living things produce enzymes.[148]

During the 1940s, methods of growing microbes in large fermenter vessels were developed for the production of penicillin and other antibiotics used in medicine.[149] Today this fermenter technology permits the commercial production of a wide range of products, which include enzymes for food and drink production processes, vitamins, amino acids and other useful chemicals.[150]

Brewers have always maintained their own strains of yeast for beer production and similarly the production of enzymes and other fermentation products nurture specifically-selected strains of production organisms.[151] These strains have inherited characteristics that improve their performance. The traditional method of developing new strains involves laborious testing of populations of microbes to detect naturally occurring genetic variants with useful properties.

In 1973, two scientists Stanley Cohen and Herbert Boyer managed for the first time to make very specific changes to the genetic make up[152] of microbes by means of genetic engineering which is also called genetic modification. The techniques developed using the microbes have since been applied to plants and animals and in a limited way, they have also

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[146]Louis Pasteur is remembered for debunking the widely accepted myth of spontaneous generation thereby setting the stage for modern biology and biochemistry. For a more detailed understanding of the works of Louis Pasteur, see Louis Pasteur (1822-1895), available at (www.accessexcellence.org/AB/BC/Louis_Pasteur), accessed on 16th/02/2004.

[147] *op. cit* no.10 at p.1-2.

[148]*ibid*. Enzymes are the proteins responsible for many of the processes of life.

[149]*op. cit*. no.10. See also R. Bud authoritative study***: "The uses of life. A history of biotechnology***" (1994) Cambridge University Press, ISBN:0 521 47699 2 (Paperback).

[150] i*bid*, R. Bud.

[151] *op. cit* no. 10 at p. 1-2.

[152]*ibid*, at p.1, here genetic make up refers to DNA which in full is deoxydbonucleic acid. DNA is the molecule in chromosomes that I the repository of genetic information in all living organisms, with the exception of a small number of viruses, in which the hereditary material is ribonucleic acid, RNA. As its coded information determines the structure and function of an organism, directly or indirectly the DNA controls the production and reproduction of the cell, organ and plant or animal. See Li. Westerlund, op cit., p. 7-8.

been applied to humans in an attempt to alleviate the symptoms of inherited illnesses.[153] Although the term biotechnology refers to a much older and broader technology than genetic engineering, the techniques of genetic engineering are of such importance that the two terms have become virtually synonymous.

3.3 Genetic engineering

Genetic engineering is the controlled modification of genetic material (DNA) by artificial means. It relies upon scientists ability to isolate specific stretches of DNA using specialized enzymes which cut the DNA precise locations. Selected DNA fragments can then be transferred into plant cells.

3.4 Genetically Modified Food

The term GM food or genetically modified organisms (herein after referred to as GMO) is most commonly used to refer to crop plants created for human or animal consumption using the latest molecular biology techniques.[154] Although biotechnology and genetic modification commonly are used interchangeably, genetic modification is a special set of technologies that alter the genetic makeup of such living organisms as animals, plants or bacteria.[155] Biotechnology, a more general term, refers to using living organisms or their components, such as enzymes to make products that include wine, cheese, beer and yoghurt.[156] Plants are modified in the laboratory to enhance desired traits such as increased resistance to herbicides or improved nutritional content. Combining genes from different organisms is known as recombinant DNA technology, and the resulting organism is said to be genetically modified, genetically engineered or transgenic.[157]

Genetic engineering can create plants with the exact desired trait very rapidly and with great accuracy.[158] For example, plant geneticists can isolate a gene responsible for drought tolerance and insert that gene into a different plant. The new genetically modified plant will gain drought tolerance as well. Not only can genes be transferred from one plant to another, but genes from non-plant organisms can also be used. The best known example of this is the use of B.t. genes in corn and other crops. B.t. or Bacillus thuringiensis, is a naturally occurring bacterium that produces crystal proteins that are lethal to insect larvae. B.t crystal

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[153] ibid, p.1.
[154] ***'Genetically Modified Foods and Organisms'*** available at (www.ornl.gov/sci/techresources/Human_Genome/elsi/gmfood), accessed on 2/2/2004.

[155] *op. cit*, no. 10.
[156] *op. cit*, no. 10 at p.4.
[157] *op.cit* no. 10 at p. 5.
[158] i*bid.*

protein genes have been transferred into corn enabling it to produce its own pesticides against insects such as the European corn borer.[159]

With such biotechnology, roses are no longer crossed with just roses. They can be mated with pigs, tomatoes with oak trees, fish with asses, butterflies with worms, orchids with snakes and the list goes on.[160] The technology that makes this possible is called genetic engineering or genetic modification.[161]

3.5 Some of the advantages of GM Food

The world population has topped 6 billion people and is predicted to double in the next 50 years.[162] Ensuring adequate food supply for this booming population is going to be a major challenge in the years to come. GM foods promise to meet this need in a number of ways:

i) Pest resistance

Crop losses from insect pests can be staggering, resulting in devastating financial loss for farmers and starvation in developing countries. Farmers typically use many tons of chemical pesticides annually.[163] Consumers do not wish to eat food that has been treated with pesticides because of potential health hazards, and run-off of agricultural wastes from excessive use of pesticides and fertilizers can poison the water supply and cause harm to the environment. Growing GM foods such as B.t. corn which are modified to be pest resistant, can help eliminate the application of chemical pesticides and reduce the cost of bringing a crop to market.

ii)Herbicide tolerance

For some crops, it is not cost-effective to remove weeds by physical means such as tilling, so farmers will often spray large quantities of different herbicides (weed-killer) to destroy weeds, a time-consuming and expensive process, that requires care so that the herbicide doesn't harm the crop plant or the environment.[164] Crop plants genetically-engineered to be resistant to one very powerful herbicide could help prevent environmental damage by reducing the amount of herbicides needed. For example, Monsanto[165] has created a strain of soybeans

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[159]For more informative overviews of some of the techniques involved in creating GM foods, see (ww.biotechknowledge.monsanto.com/biotech/bbasics.nsf7index), accessed on 27th-2-2004.

[160]*op. cit.* no. 4.-N.Batalion at 3.

[161] *ibid*. p. 7.

[162] Deborah B Whitman: ***'Genetically Modified Foods: Harmful or Helpful'*** at p. 2, available at (www.csa.com/hottopics/gmfood/oview.html), accessed on 2-2-2004

[163] *ibid* at p. 2.

[164] *ibid*

[165] Monsato is one of the American companies that has taken on active investment in the agro-biotechnology industry.

genetically modified not to be affected by their herbicide product Roundup ®.[166] A farmer grows these soybeans which then only require one application of weed-killer instead of multiple applications, reducing production cost and limiting the dangers of agricultural waste run-off.

iii) Disease resistance

There are many viruses, fungi and bacteria that cause plant diseases. Plant biologists are working to create plants with genetically-engineered resistance to these diseases.

iv) Cold tolerance

Unexpected frost can destroy sensitive seedlings. An antifreeze gene from cold water fish has been introduced into plants such as tobacco and potato.[167] With this antifreeze gene, these plants are able to tolerate cold temperatures that normally would kill unmodified seedlings.

v) Drought tolerance

As the world population grows and more land is utilized for housing instead of food production, farmers will need to grow crops in locations previously unsuited for plant cultivation. Creating plants that can withstand long periods of drought or high salt content in soil and groundwater will help people to grow crops in formerly inhospitable places.

vi) Nutrition

Malnutrition is common in third world countries where impoverished people rely on a single crop such as rice or corn for the main staple of their diet.[168] However, rice and corn do not contain adequate amounts of all necessary nutrients to prevent malnutrition. If rice could be genetically engineered to contain additional vitamins and minerals, nutrient deficiencies could be alleviated. For example, blindness due to vitamin A deficiency is a common problem in third world countries.[169] Researchers at the Swiss Federal Institute of Technology-Institute for Plant Sciences have created a strain of "golden" rice containing an unusually high content of beta-carotene (vitamin A).[170] Such new strains can go along way in availing more nutritious food.

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[166] *op.cit* no.30.
[167] *ibid.*
[168] *ibid.*
[169] *ibid* at p. 2.
[170] i*bid.*

vii) Pharmaceuticals

Medicines and vaccines often are costly to produce and sometimes require special storage conditions not readily available in third world countries. Researchers are working to develop edible vaccines in tomatoes and potatoes.[171] These vaccines will be much easier to ship, store and administer than traditional injection vaccines.

viii) Phytoremediation

Not all GM plants are grown as crops. Soil and groundwater pollution continues to be a problem in all parts of the world. Plants such as poplar trees have been genetically engineered to clean up heavy metal pollution from contaminated soil.[172]

3.6 Criticisms against GM Food

'A year after…A massive spraying… there was not a sound of the song of bird…What was man doing to…our beautiful world…Who has made the decision that sets in motion…this ever-widening wave of death.'[173]

In this tone, environmental activists, religious organizations, public interest groups, professional associations and scientists have all raised concerns about GM foods, and criticized agribusiness companies for pursuing profit without concern for potential hazards, and governments for failing to exercise adequate regulatory oversight. Most concerns about GM foods fall into three categories: environmental hazards, human health risks, and economic concerns.

3.6.1 Environmental Hazards

i) Unintended harm to other organisms

There are laboratory studies showing that pollen from B.t. corn caused high mortality rates in monarch butterfly caterpillars.[174] Monarch caterpillars consume milkweed plants, not corn, but the fear is that if pollen from B.t. corn is blown by the wind onto milkweed plants in neighbouring fields, the caterpillars could eat the pollen and perish.

Unfortunately, B.t. toxins kill many species of insect larvae indiscriminately; it is not possible to design a B.t. toxin that would only kill crop-damaging pests and remain harmless to all other insects.[175]

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[171] ibid
[172] *ibid.*
[173] The eloquent words of the late Rachel Carsons ***'Silent Spring'***, also cited in *op cit* no.4, ***Nathan Batallion et al*** at p.4.
[174] *op. cit* no. 30 at p.5.
[175] *ibid.*

ii) Reduced effectiveness of pesticides

Just as some populations of mosquitoes developed resistance to the now-banned pesticide DDT, many people are concerned that insects will become resistant to B.t. or other crops that have been genetically-modified to produce their own pesticides.

iii) Gene transfer to non-target species

Another concern is that crop plants engineered for herbicide tolerance and weeds will cross-breed, resulting in the transfer of the herbicide resistance genes from the crops into the weeds. These "super weeds" would then be herbicide tolerant as well. Other introduced genes may cross over into non-modified crops planted next to GM crops. The possibility of interbreeding is shown by the defence of farmers in law suits filed by Monsanto.[176] The company has filed patent infringement lawsuits against farmers who may have harvested GM crops. Monsanto claims that the farmers obtained Monsanto-licensed GM seeds from an unknown source and did not pay royalties to Monsanto. The farmers claim that their unmodified crops were cross-pollinated from someone else's GM crops planted a field or two away.

There are several possible solutions to the three problems mentioned above. Genes are exchanged between plants via pollen. Two ways to ensure that non-target species will not receive introduced genes from GM plants are to create GM plants that are male sterile (ie do not produce pollen) or to modify the GM plant so that the pollen does not contain the introduced gene.[177] Cross-pollination would not occur, and if harmless insects such as monarch caterpillars were to eat pollen from GM plants, the caterpillars would survive.

Another suggested solution is to create buffer zones around fields of GM crops.[178] For example, non-GM corn would be planted to surround a field of B.t. GM corn, and the non-GM corn would not be harvested. Beneficial or harmless insects would have a refuge in the non-GM corn, and insect pests could be allowed to destroy the non-GM corn and would not develop resistance to B.t. pesticides. Gene transfer to weeds and other crops would not occur because the wind-blown pollen would not travel beyond the buffer zone. However, this planting method may not be feasible if too much acreage is required for the buffer zones. This is particularly the case if you consider third world countries where most of the farmers are small scale and land for buffer zones will be to expensive to acquire.

[176] *ibid*.
[177] *ibid* at p.6
[178] *ibid.*

3.6.2 Human Health Risks

i) Allergenicity

Many children in the US and Europe have developed life-threatening allergies to peanuts and other foods with a GM content.[179] There is a possibility that introducing a gene into a plant may create a new allergen or cause an allergic reaction in susceptible individuals. A proposal to incorporate a gene from Brazil nuts into soybeans was abandoned because of the fear of causing unexpected allergic reactions.[180] Extensive testing of GM foods may be required to avoid the possibility of harm to consumers with food allergies and labelling of GM foods and food products will acquire new importance.

3.6.3 Economic Concerns

Bringing a GM food to market is a lengthy and costly process, and of course agri-biotech companies wish to ensure a profitable return on their investment. Many new plant genetic engineering technologies and GM plants have been patented, and patent infringement is a big concern of agribusiness. Yet consumer advocates are worried that patenting these new plant varieties will raise the price of seeds so high that small farmers and third world countries will not be able to afford seeds for GM crops, thus widening the gap between the wealthy and the poor.[181]

Patent enforcement may also be difficult, as the contention of the farmers that they involuntarily grew Monsanto-engineered strains when their crops were cross-pollinated shows. One way to combat possible patent infringement is to introduce a "suicide gene" into GM plants.[182] The plants with this gene would be viable for only one growing season and would produce sterile seeds that do not germinate. Farmers would need to buy a fresh supply of seeds each year. However, this would be financially disastrous for farmers in third world countries who cannot afford to buy seed each year and traditionally set aside a portion of their harvest to plant in the next growing season.

3.7.0 Labeling of GM Food

Labeling is the means by which producers of GM food are required to show on the packaging of their food that their product is genetically modified and in what percentages. This it is argued is to give the consumers the informed choice in buying such GM food. Labeling of GM foods and food products is however a contentious issue. On the whole, agribusiness industries believe that labeling should be voluntary

[179] *ibid.*
[180] *ibid.*
[181] *ibid* at p.7.
[182] *ibid.*

and influenced by the demands of the free market.[183] If consumers show preference for labeled foods over non-labeled foods, then industry will have the incentive to regulate itself or risk alienating the customer. Consumer interest groups, on the other hand, are demanding mandatory labeling. People have the right to know what they are eating, argue the interest groups, and historically industry has proven itself to be unreliable at self-compliance with existing safety regulations.

3.7.1 The Question of Price

There are many questions that must be answered if labeling of GM foods becomes mandatory in a given country. First, are consumers willing to absorb the cost of such an initiative? If the food production industry is required to label GM foods, factories will need to construct two separate processing streams and monitor the production lines accordingly. Farmers must be able to keep GM crops and non-GM crops from mixing during planting, harvesting and shipping. It is almost assured that industry will pass along these additional costs to consumers in the form of higher prices.

3.7.2 Acceptable Limits

Secondly, what are the acceptable limits of GM contamination in non-GM products? The European Union has determined that 1% is an acceptable limit of cross-contamination.[184] Yet many consumer interest groups argue that only 0% is acceptable. Some companies such as Gerber baby foods 42 and Frito-Lay 43 have pledged to avoid use of GM foods in any of their products.[185] But who is going to monitor these companies for compliance and what is the penalty if they fail especially if you take the case of the developing and least developed countries which may have weak legal systems.

3.7.3 Level of Detectability of GM food cross-contamination.

Scientists agree that current technology is unable to detect minute quantities of contamination, so ensuring 0% contamination using existing methodologies is not guaranteed.[186] Yet researchers disagree on what level of contamination really is detectable, especially in highly processed food products such as vegetable oils or breakfast cereals where the vegetables used to make these products have been pooled from many different sources. A 1% threshold may already be below current levels of detectability.

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[183] *ibid at p.10.*
[184] See European Union Directive 98/44 on legal protection of biotechnological inventions.
[185] *op. cit* no.30.
[186] *ibid*

3.7.4 Responsibility for Education

Finally, who is to be responsible for educating the public about GM food labels and how costly will that education be? Food labels must be designed to clearly convey accurate information about the product in simple language that everyone can understand. This may be the greatest challenge faced by a new food labeling policy in a given country: how to educate and inform the public without damaging the public trust and causing alarm or fear of GM food products is a big task.

In January 2000, an international trade agreement for labeling GM foods was established. More than 130 countries, including the US, the world's largest producer of GM foods, signed the agreement.[187] The policy states that exporters must be required to label all GM foods and that importing countries have the right to judge for themselves the potential risks and reject GM foods, if they so choose.

[187] *ibid*

Chapter Four

4.0 The Right to Food and Food Security Under International Law

4.1 The Right to Food

Article 25 of the UDHR[188] and article 11 of the ICESCR[189] form the authoritative baseline for the right to food under international human rights law.[190] The right to food is closely linked to the right to an adequate standard of living and it forms an integral part of the right to life.[191] Effectively the right to food is a basic human right and a basic human need. Realization of the right to adequate food is achieved when every man, woman or child individually or in community with others has/have physical and economic access at all times to adequate food or means for its procurement.[192] States have the obligation to take the necessary action to mitigate and alleviate hunger.

Conventionally, human rights have been split into civil and political rights, socio economic rights and solidarity rights- a relatively recent bracket. Many times these rights have also been treated differently with civil and political rights being emphasized more than the others.[193] In this dictate, the right to food is essentially a social right. However contemporary interpretation requires that all human rights are universal, indivisible, interdependent and interrelated. The international community must treat human rights globally in a fair and equal manner, on the same footing and with the same emphasis.[194]

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[188] It states inter alia: 'Everyone has the right to a standard of living adequate for the health and wellbeing of himself and his family, including food, clothing, housing, medical care and necessary social services…'

[189] It states inter alia: 'The state parties… recognise the right of everyone to an adequate standard of living for himself and his family, including adequate food… The state parties will take appropriate steps to ensure realisation of this right, recognising to this effect the essential importance of international cooperation based on free consent…'

[190] However the right to food is also provided for in: article 12 of the Convention on the Elimination of Discrimination Against Women, article 24 of the Convention on the Rights of the Child, article 2 of the Convention on the Prohibition and Punishment of the crime of Genocide, article 21 of the African Charter on Human and People's Rights, article 12 of the Salvador Protocol to the American Convention on Human Rights, included in the 1948 Geneva Conventions 1,111,1V and the 1977 Additional Protocols and the Statute of the International Criminal Court-Part 2, articles 6-8.

[191] The Human Rights Committee –a treaty body established under the ICCPR, in its General Comment No.6(1982) on the right to life enunciated that: 'the expression 'inherent right to life' can not properly be understood in a restrictive manner, and the protection of this right requires that states adopt positive measures… to reduce infant mortality, increase life expectancy especially by adopting measures to eliminate malnutrition and epidemics.'

[192] General Comment No. 12(1999). '***Right to adequate food***.' Report of the Committee on Economic, Social and Cultural Rights. UN Doc. E/2000/22.Paragraph 6, p.102-110.

[193] Such classification is purely on ideological terms and has no legal backing.

[194] See paragraph 5 of the Vienna Declaration and Programme of Action adopted at the 1993 World Conference on Human Rights. A/CONF.157/24

The notion of 'adequacy' is of particular significance because the notion of sustainability is intrisically linked to the notion of adequate food or food security, implying food being accessible for both the present and future generations, however the precise meaning of adequacy is largely dependant on prevailing social, economic, cultural, climatic, ecological and other conditions while sustainability incorporates the aspect of long term availability and accessibility.[195]

The core content of the right to adequate food implies the availability of food in a quantity and quality sufficient to satisfy the dietary needs of individuals, free from adverse substances and acceptable within a given culture and the availability of such food in such ways that are sustainable and do not interfere with the enjoyment of other human rights.[196]

4.2 Obligations on the State

Under article 2 of the ICESCR, a state shall take steps to the maximum of its available resources, with a view to achieving progressively the full realization of the right to food.[197] The concept of progressive realization recognizes that full realization of the right to food, generally will not be achieved in a short period of time but it imposes an obligation on the state to move as expeditiously as possible towards the realization of this right.

It should however be understood that state obligations are intended to supplement personal efforts whenever needed.[198] The individual is expected whenever possible through his or her own efforts and by use of his own resources, to find ways to ensure the satisfaction of his or her own needs, individually or in association with others.[199]

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[195] General Comment No. 12, *op cit.* no.60, paragraph 6.

[196] The term 'dietary needs' refers to those needs, which are necessary for physical and mental growth, and physical activity, 'free from adverse substances' requires certain measures such as food safety, hygiene and environmental protection. 'Cultural or consumer acceptability' requires the need to take into account values attached to food and food consumption for example religious beliefs etc. 'Availability' implies either a possibility to feed oneself from productive land or the existence of a well-functioning food distribution system. 'Accessibility' consists of both economic and physical accessibility with vulnerable groups such as indigenous peoples (who may not have access to their ancestral lands) needing special attention or programmes. See General Comment No. 12, *ibid*., paragraph 8.

[197] See also General Comment No. 3(1990). ***Nature of state obligations under article 2(1).*** Report of the Committee on Economic, Social and Cultural rights. UN Doc.E/1991/23. p.83-87. Also state obligations in respect to economic social and cultural rights have been elaborated by a group of experts, convened by the International Commission of Jurists in Limburg-Netherlands in June 1986. The outcome of the meeting, the so called Limburg Principles offer a guide on state obligations under the ICESCR. See the Limburg Principles on the Implementation of the ICESCR at UN Doc E/CN.4/1987/17.

[198] See Asbjorn Eide. ***The Right to an adequate standard of living including the right to food. A.Eide et al (eds.). Economic Social and Cultural Rights. 2nd ed.2001. Kluwer Law Internatioal.Hague.p.138-140.***

[199] The realisation of individual social, economic and cultural rights will usually take place within the context of a household as the smallest economic unit.

Like with other classically socio-economic rights, in order to ensure the right to food for the population, there are three levels of obligations on the state. These are the obligations to respect, to protect and to fulfill.

4.2.1 Obligation to respect

At the primary level, the state must respect existing access to adequate food and must not take measures that result in preventing such access.

The state must respect the individuals freedom and space to be able by their own means to produce their own food or to use their own resources to obtain to obtain food on the market.

In this regard, collective or group rights are particularly important. The resources belonging to indigenous peoples such as claims to lands must be respected if such peoples are to meet their basic needs.[200] Similarly, respect of the rights of the peoples to exercise permanent sovereignty over their natural resources may be essential for them to be able through their own collective, to satisfy their needs. Therefore the state should take steps to recognize and register the land rights of indigenous peoples and land tenure of small-scale farmers whose title is uncertain.

4.2.2 Obligation to protect

At the secondary level, measures are required of the state to ensure that corporations or individuals do not deprive individuals of their access to adequate food.[201] The state should protect its citizens against third parties, by the preservation of existing rights or resources.

In this capacity as protector, the state should prevent the encroachment on the land of indigenous peoples or other vulnerable groups by more aggressive third parties such as more powerful economic interests like MNCs.[202] The state should also protect its citizens against fraud, against unethical behavior in trade and contractual relations and, against the marketing and dumping of harzadous or dangerous products that threatens the individuals right to food.

The state should also protect rural farmers from the corporate patenting of genetic material of seeds and the subsequent attempts to prevent farmers to sell or reuse seeds with the same genetic structure (seeds that may have been

[200] The lack of recognition of the collective land rights of indigenous peoples has been a major cause of their impoverishment in many parts of the world. It is becoming increasingly recognized both at the national and international level that their rights must be respected and protected.

[201] General Comment No. 2, paragraph 15.

[202] The state in carrying out this obligation could also by law require the protection of land for groups of people who have a close connection to the land eg indigenous peoples or require by law tat land can be owned only by the tiller of the land especially when agriculture is the major basis of income. This may be even more important in the realization of the right to food for these people. Asbjorn Eide, op cit p.143.

developed as hybrids and used for long periods of time by these very communities) if they have not been purchased from, or royalties paid to, the corporate holder of the patent.

It has been said that perhaps the protective function of the state is the most important aspect of state obligations.[203] There is a need for the state to establish a buffer, which makes it possible for those on the borderline of poverty to overcome a crisis and be able to ensure an adequate standard of living through their own means. The obligation to protect would also require the state to ensure that food on the market is safe and healthy and also to ensure food availability and regulation of food prices and subsidies.

4.2.3 Obligation to fulfill

At the tertiary level the state is under obligation to fulfill the right to adequate food. This could be by facilitating the same or through direct provision.
Facilitation would mean that the state must pro-actively engage in activities intended to strengthen peoples access to and use of resources and means to ensure their livelihood, including food security. It could require the state to take measures to improve methods of production, conservation and distribution of food by making full use technical and scientific knowledge by disseminating knowledge of the principles of nutrition and developing or reforming agrarian systems in such a way as to achieve the most efficient development and utilization of natural resources.[204]

Whenever an individual or group is unable to-, for reasons beyond their control, to enjoy the right to adequate food by the means at their disposal, the state has an obligation to fulfill that right directly. This could consist of the direct provision of food resources, which can be used for food e.g. direct food aid or social security when no other possibility exists.

However, in practice, the ability of developing countries to directly provide food aid or other resources for food to their citizens is severely curtailed or is made increasingly difficult or impossible due to a variety of factors such as the lack of domestic financial resources due to the servicing of international debts, economic policies imposed by international financial institutions i.e. the IMF and World Bank e.g. structural adjustment programmes etc.

[203] See Asbjorn Eide, Economic Social and Cultural Rights as Human Rights in , A. Eide et al (eds) Economic, Social and Cultural Rights. 2nd ed. 2001. Kluwer Law International.
[204] See article 11(2) of ICESCR.

4.3 Food Security

In September 2000 at the World Millennium Summit held at the UN headquarters in New York-USA, all the member states of the United Nations adopted the UN Millennium Declaration.[205] One of the UN Millennium goals is the eradication of extreme poverty and hunger, a goal that is to be achieved by reducing by half the number of people living on less than a dollar a day and those suffering from hunger by 2015.[206]

Food security exists when 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.[207] Enjoyment of the right to food can be fulfilled in various ways and by varying degrees of implementation of the conditions of full food security, a normative aspiration.[208] It is here that the levels of state obligation aid in ensuring the individuals right to food even where food security in the sense of a sustained state of affairs has not been reached yet.

The World Food Summit held in Rome, Italy in 1996 laid the foundations for diverse paths to achieve food security at the individual, national, regional and international levels.[209] The summit reaffirmed the right of everyone to have access to safe and nutritious food, consistent with the right to adequate food and the fundamental right of everyone to be free from hunger.[210]

The summit noted that while food supplies have increased substantially, constraints on access to food and continuing inadequacy of household and national incomes to purchase food, instability of supply and demand, as well as natural and man made disasters, have prevented basic food needs from being fulfilled.

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[205] See text available at (www.un.org/millennium/declaration/ares552e.html.), accessed on 1st February 2004.

[206] See the text available at (www.un.org/millenniumgoals/index.html), accessed on 1st February 2004.

[207] Paragraph 1, World Food Summit Plan of Action. It should be noted that 'food security' and the right to food are conceptually different. The right to food is an individual human right while food security is the condition through which this right can be realised. Food security is not in itself the right to food but rather a state, which if attained permits the individual to enjoy that right. See Asbjorn Eide and Wench Barth Eide in G. Alfredsson and A.Eide (eds) ***The Universal Declaration of Human Rights***. 1999. Kluwer Law International. Hague. p.540-541.

[208] *ibid*, G. Alfredsson and A.Eide at p.540.

[209] The representatives of the 185 member states of the United Nations and the EC pledged their political will and commitment to achieve food security for all and eradicate hunger in all countries, with an immediate view to reduce the number of undernourished people by half no later than 2015. The summit adopted the 'Rome Declaration on World Food Security' which comprises a set of observations on food security and also an action plan ie 'World Food Summit Plan of Action.' This Action Plan is a set of seven commitments made by countries attending the summit to ensure food security. The Rome Declaration is not a legally binding document. See (www.fao.org/worldfoodsummit) and text at (www.fao.org/docrep/003/w3613e/3613e00.htm), accessed on 20th January 2004.

[210] Rome Declaration on World Food Security, FAO 1996.

Further that the problems of hunger and food insecurity have global dimensions and are likely to persist, and even after increase dramatically in some regions, unless urgent, determined and concerted action is taken, given the anticipated increase in the worlds population and the stress on natural resources.

In June 2002, the Food and Agricultural Organisation (herein after referred to as FAO), organized a follow up summit to the one of 1996. At this 2002 World Food Summit,[211] it was acknowledged that the problem of food insecurity had increased particularly in developing countries. It unanimously adopted a declaration reaffirming the call to the international community to reduce the number of undernourished people by half by 2015, a goal of the 1996 summit.[212] The summit also reaffirmed the right of everyone to have access to safe and nutritious food and that the success of this would require political will, resources, technology and fairer trade practices. A call for an international alliance to accelerate action to reduce world hunger was made.

The summit notably recognized the importance of the International Treaty on Plant Genetic Resources for Food and Agriculture in achieving food security.

At the two summits, states committed themselves to implement policies aimed at eradicating poverty and inequality and improving the physical and economic access by all, at all times to sufficient, nutritionally adequate and safe food.
The 2002 summit further recognized that developing countries were facing challenges in making better use of benefits in research and technology and also in responding to the challenges and opportunities of globalization in the field of agriculture and food security.

In the spirit of cooperation and solidarity, a pledge was made for strengthening FAOs work within its mandate, to enable developing countries cope with the challenges and reap the benefits of globalization and also have access to the necessary scientific and technical knowledge related to the new technologies that address poverty and hunger reduction.

4.4 The Convention on Biological Diversity (CBD)

Adopted in 1992 at the United Nations Conference on the Environment and Development (UNCED) also dubbed 'Earth Summit,' the CBD came into force in 1993.[213] The issue of IPRs was very prominent in the negotiations.

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[211] At this 2002 summit, 179 countries and the EU attended. See (www.fao.org/worldfoodsummit/english/index.html), accessed on 19th January 2004.
[212] See text of the declaration at (www.fao.org/DOCREP/MEETING/005/Y7106E09/Y7106E09.htm#TopOfPage), accessed on 19th January 2004.
[213] See Johnson, Stanley P. ***The Earth Summit: The United Nations Conference on Environment and Development (UNCED)***. 1993. International Environmental Law and

The main issues of concern pertained to the ownership of biological resources both within (in situ) and without (ex situ) national boundaries and in gene banks (e.g. CGIAR) and biotechnological innovations ensuing from those resources.[214]

In its preamble, the CBD recognizes that the conservation and sustainable use of bio diversity is of crucial importance for meeting the food, health and other needs of a growing world population, for which purpose access to and sharing of both genetic resources and technologies are essential. It also recognizes the vital role of women in the conservation and sustainable use of biological diversity and affirms the need to include women in all decision-making processes for bio diversity conservation.
The main aims of the CBD are 'the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of benefits arising out of the use of genetic resources, including by appropriate transfer relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.'[215]

The preamble of the CBD also recognizes that the conservation of bio diversity is now a 'common concern of human kind.' In spite of the international trend towards the conservation of bio diversity as a common concern, states generally are responsible for the sustainable conservation of the bio diversity within their boundaries. Therefore the CBD recognizes the sovereign rights of states over their biological and genetic resources.[216] The CBD further emphasizes that the authority to determine access rests with national governments and is subject to national legislation.[217] The CBD also recognizes the close and traditional dependence of many indigenous and local communities on biological resources and deals with traditional knowledge in the context of conservation and sustainable use of bio diversity.[218]

4.5 The International Treaty on Plant Genetic Resources (PGRs)

On 3rd November 2001, the FAO Conference adopted the International Treaty on Plant Genetic Resources for Food and Agriculture.[219] It covers

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Policy Series. Graham and Trotman/Martinus Nijhoff. London. P.81-102. See text at (www.biodiv.org/default.asp), accessed on 10th February 2004

[214] The CBD does not apply to ex situ collections such as those held by gene banks like CGIAR centres collected prior to the date when the CBD came into force. These ex situ collections are dealt with in the FAO Treaty.

[215] Article 1 of the CBD.

[216] Article 3, 15(1) of the CBD.

[217] Article 15

[218] Mugabe, J, ***Intellectual Property Protection and Traditional Knowledge: An Exploration in International Policy Discourse*** (1999), African Centre for Technology Studies (ACTS). ACTS Press. Biopolicy International Series. No. 21. Nairobi Kenya. at p. 21.

[219] It was adopted by resolution 3/2001 with only two countries abstaining, notably USA and Japan. See Mekoaur Ali. ***A Global Instrument on Agro-biodiversity: The International Treaty on Plant Genetic Resources for Food and Agriculture***. January

all PGRs relevant to food and agriculture[220] and will come into force three months after it has been ratified by 40 states.[221]

Once in force, the treaty will replace the IU,[222] a non-binding agreement adopted by the FAO Conference in1983.[223] The treaty as a legally binding instrument goes much further than the IU as it represents a legally binding international commitment to the improvement of the world's key food and feed crops.

The aims of the treaty are stated as 'the conservation and sustainable use of PGRs for food and agriculture and the fair and equitable sharing of benefits derived from their use, in harmony with the CBD, for sustainable agriculture and food security.[224]

From its preamble, the treaty recognizes the 'special nature of PGRs for food and agriculture, their distinctive features and problems needing distinctive solutions.' It recognizes that PGRs for food and agriculture 'are a common concern of all countries, in that all countries depend very largely on PGRs for food and agriculture that originated elsewhere.' This notion of 'common concern of all countries' is also found in the CBD and as in the CBD, the treaty affirms the sovereign rights of states over their PGRs for food and agriculture.[225]

The preamble further states that 'the conservation, exploration, collection, characterization, evaluation and documentation of PGRs for food and agriculture are essential in meeting the goals of the Rome Declaration on World Food Security and the World Food Summit Plan of Action and for sustainable agricultural development for this and future generations…'

It also provides that PGRs for food and agriculture ' are the raw material indispensable for crop genetic improvement, whether by means of farmers' selection, classical plant breeding or modern bio technologies, and are

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2002. FAO Legal Papers Online#24 available at (www.fao.org/Legal/pub-e), accessed on 2nd February 2004.

[220] Article 3 of treaty.

[221] Article 28 of treaty.

[222] The Iu is the International Undertaking on Plant Genetic Resources for Food and Agriculture.

[223] The IU was adopted by Resolution 8/83 and was the first international agreement to deal with the sustainable management of PGRs for food and agriculture. It formalised the de facto status of PGRs as a common heritage of mankind that should be available without restriction. Subsequently, three other interpretative FAO resolutions were adopted and annexed to the IU, namely: Resolution 4/89 with recognised farmers' rights and UPOV-based PBRs as compatible with the IU; Resolution 5/89 which conceptualised the notion of farmers' rights; Resolution 3/91 which recognised the sovereign rights of nations over their PGRs and set out the farmers' rights that could be implemented through a fund for PGRs. FAOs Commission on Genetic Resources for Food and Agriculture served as the secretariat of the IU. See Ali Makoaur, *op cit*, p.2.

[224] Article 1of the treaty.

[225] See preamble, article 10 of treaty.

essential in adapting to unpredictable environmental changes and future human needs.

The treaty further acknowledges that PGRs for food and agriculture raise a synergy of issues in agriculture, commerce and the environment. It states that the treaty and other international agreements relevant to it should be mutually supportive with a view to sustainable agriculture and food security.[226] It also emphasizes that PGRs should be conserved and used in a sustainable way, spelling out the types of action to be taken to achieve this.[227]

The treaty does set a clear and predictable framework for access to PGRs and a greater balance of the relevant interest groups. It ensures that both formal and informal plant breeders (e.g. rural farmers) have access to PGRs they need and prevents their monopolization, through IPRs, by third parties eg. MNCs.

4.6 The International Union for the Protection of New Varieties of Plants (UPOV)

The International Union for the Protection of New Varieties of Plants is an intergovernmental organisation based on the International Convention for the Protection of new varieties of plants, adopted on 2nd December 1961. The objective of the Convention is the protection of new varieties of plants by an intellectual property rights system.[228]

UPOV is a regime set up in order to protect plant breeders. It provides a sui generis system different from patents, that gives special protection for new plant varieties. UPOV has only 47 member states, most of which are developed countries but over the years developing countries have considered joining as it provides a practical sui generis system for the protection of plant varieties compared to the hard to achieve criteria of inventiveness and registration for patents in TRIPS. The UPOV Convention of 1961 has been revised three times, in 1972, in 1978 and in 1991, and most countries are now members of either the 1978 Act or 1991 Act.

According to the 1978 and 1991 acts of the UPOV Convention there are four requirements on a plant variety in order for it to be protected: these are novelty, distinctness, uniformity and stability. Novelty means that

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[227] Article 6 of the treaty. These include: (i) encouraging farming systems that enhance the sustainable use of agro-biodiversity and other natural resources; (ii) maximising intra and inter specific variations for the benefit of farmers, especially those who apply ecological principles in maintaining soil fertility and combating diseases, weeds and pests; (iii) broadening the genetic base of crops and increasing the range of genetic diversity available to farmers; and (iv) promoting increased world food production compatible with sustainable development.

[228] UPOV: 'What is UPOV.' Available at (www.upov.gov.org), accessed on 2nd February 2004.

the variety must not have been commercialized. More precisely the plant variety may not for more than one year have been offered for sale or marketed with the consent of the breeder in the state where, protection is sought, nor for more than four years in any other state. The 1991 act further requires that the propagating or harvested material of a plant variety may not have been sold or in any other way disposed to others. The requirement of distinctness means that the plant variety must be by at least one important characteristic clearly distinguishable from any other variety. Uniformity means that the plant variety must be sufficiently uniform. Variations that may be expected from the particular features of the mode of propagation of the plant variety are acceptable. With the same exception, the plant variety must also be stable in its essential characteristics. Finally the variety shall be given a denomination that identifies it and clearly distinguishes it from other varieties not giving rise to confusion or being misleading. The time of protection of a plant variety according to the 1991 act shall be at least 20 years and 25 for grapevines and trees. In the context of this paper, it is arguable that GM crops and food as new life forms are new plant varieties and MNCs or other individuals who own patents over them are plant breeders.

4.7 Patenting of New Life Forms and Food Security

The origins of patenting of new life forms can well be traced in America in the 1980s. The US Supreme Court held that biological life forms could be legally patentable. Ananda Mohan Chakrabarty, a microbiologist and employee of General Electric (GE) developed at the time by genetic modification, a type of bacteria that could ingest oil. GE rushed to apply for a patent over it in 1971. After several years of review the US Patent and Trade-Mark Office turned down the request under the traditional doctrine that life forms are not patentable. GE sued and won. The US Supreme Court held that 'anything under the sun that is made by man' is patentable.[229] In 1985, the US Patent and Trade-Mark office extended the court decision finding that the Chakrabarty ruling could be extended to all plants, seeds and plant tissues or the entire plant kingdom.

[229] The eligibility of life forms as patentable subject matter (as a point of law) is now settled in light of the EC Directive, EPO case law and US case law. The US Supreme court decision in Diamond, Commissioner of Patents and Trademarks vs. Chakrabarty, 447 US 303 (1980) addresses the scope of patentable subject matter by stating that 'anything under the sun that is made by man' is patentable. The Supreme Court further stated that an artificially created life form- the new form of bacterium obtained by genetic engineering- is patentable subject matter. By virtue of this, the USPTO began to issue different types of patents protecting biotechnological methods of breeding and biotechnologically produced plants. In addition, the USPTO has also interpreted this decision to mean that any plant can be patented, provided it satisfies the conditions on patentability. However, the patenting of life forms is still contested on ethical, cultural and religious grounds. See Frederick Abbott et al, *op.cit*., p.28-42.

As a result of these events, powerful agro-bussiness MNCs have emerged from mergers in order to effectively control the seed industry.[230] This is by acquiring patents on genetically engineered seeds that they produce.

Apparently it was observed that plant biotechnology patents represent about 1% of the total number of patents granted annually worldwide.[231] In 1990-1995, the USA, EU and Japan (combined) accounted for 93% of biotechnology patents while the rest of the world where all developing countries fall only accounted for less than 7% of the total.[232] Patents relating to agriculture represented only 11% of the total for 1992-1995 while those specifically covering modified plants represented 6% of the total.[233] At least five US MNCs accounted for 44% of the total plant patents during this period.[234]

It is relatively clear that biotech patents are being aggressively enforced and are being used to establish a competitive advantage in the market place.

Amidst all this, between 15 and 20 percent of the food in the world is grown by small- scale farmers. Traditionally these farmers save their seeds in order to replant them the next season. This helps them avoid the costs of purchasing new seeds every year. Yet with patents on such seeds and the failure of the UPOV sui generis system to protect such farmers, such replanting is effectively illegal. This is because under TRIPS which has to be satisfied in any event, stocking for purposes such as production or reproduction require the breeders authorization. In effect the poor farmers in the third world will have to get authorization from the large MNCs in the developed world before they can replant their seeds. This is bound to entrench the dependency syndrome forcing

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[230] Some of the important mergers and acquisitions include: Monsato's acquisition of majority shares in Calgene, this gives Monsato an extremely strong position in the field of transgenic cannola, tomato and cotton, the acquisition of plant genetic systems (PGS) by AgroEvo, PGS is a world leader in the field of insect-resistant plants and in canola transgenics, AgroEvo which is largely owned by Hoeschst, has developed herbicide-resistant corn and soybean. There is also the merger between Agri Dyne and Biosys- both leaders in bio-pesticides in the market and it is working on the use of recombitant DNA technology for synthetically producing pyrethrum, an important plant-based insecticide. For more details on agro-bussiness mergers taking advantage of patents on new life forms see CUTS Briefing Paper: '***TRIPS, Biotechnology and Global Competition'*** available at (www.www.cuts-india.org/1998-2.htm), accessed on 26th February 2004.

[231] Correa, Carlos M. ***Intellectual Property Rights, the WTO and Developing Countries: The TRIPS Agreement and Policy Options***. 2000. Zed Books Ltd. London & New York. P.173-174.

[232] ibid.

[233] *ibid*.

[234] *ibid*. In order of those most active, they were Pioneer Hi-Bred International, Monsato, Calgene, Holden's Foundation Seeds and Dupont de Nemours.

these farmers to purchase seeds from the MNCs every year while farmers' costs will rise annually and may force them off their land.[235]

While on the other hand, the agro-bussiness MNCs knew from the very start that in patents on new plant varieties (which they were bound to be in control of in a matter of time), lay the secret of world agro-based control and amassing wealth for themselves.

The minimum term of protection for patents is 20 years, after which the invention falls into the public domain.[236] During the term of protection a patentee has exclusive property rights. The granting of a patent entails a prohibition, ius excluendi, of the patented material in the countries where the rights have been recognized.[237]

A product patent confers on its owner the exclusive right to prevent third parties from making, using, offering for sale or importing for those purposes the product without the patent holders consent.[238] In the case of a process patent, the patent holder may prevent the use of the process as well as the commercialization of a product obtained directly by that process.[239] Thus if a process (e.g. genetic engineering) to produce a plant (e.g. transgenic plant like corn which may be necessary to curb hunger in the third world) were patented, exclusive rights would also extend to the plant obtained with the patented process.[240]

In principle, patents are negative rights to the extent that they exclude or prevent third parties from making, using or commercializing an invention without the authorization of the patent holder. A patent on either a biotech product or process would exclude/prevent other parties from the production, reproduction (multiplication), research, breeding and commercialization of such biotech product or process.

Access to patented biotech products or processes would be subject to terms set by the patent holder such as conclusion of licensing agreements with such terms and conditions as the patent holder might see fit e.g. the payment of royalties. This impedes and interferes with the exchange of plant materials and knowledge amongst researchers, countries, universities and other stakeholders. This could particularly have serious consequences for public research in developing countries, which normally have scarce financial resources.

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[235] Julian. Oram***: The TRIPS Agreement and its Implications for Food Security*** at paragraph 9 available at (www.voice.buz.org/biopatenting/Jorran.html), accessed on 19th February 2004.
[236] Article 33 of TRIPS.
[237] Carlos Correa *op. cit*., p.176.
[238] Article 28(1)(a) of TRIPS.
[239] Article 28(1)(b) of TRIPS.
[240] Carlos Correa, *op cit*., p.176. Article 34(1) of TRIPS places the burden of proof in process patents on the producer, for him to show that he did not use the patented process to produce his product.

A patentee may also prevent farmers from traditionally saving and reusing seeds in subsequent planting seasons and/or commercially exploiting a harvest, if the seeds thus used are patented. In addition a patent holder may prevent farmers from breeding new varieties using patented seeds.

Patents on agricultural biotechnology have also had negative impact on agricultural research. Patents have broken down the traditional access and benefit–sharing system that previously existed between developing and developed countries where on the one hand developing countries provided free access to genetic resources and the developed countries freely received the benefits of research that used those resources. Today developing countries still provide access to genetic resources for free but the benefits of research that use those resources are no longer free or accessible as before.

Patents have also hindered the traditional flow of knowledge and genetic material among researchers. There is a lack of 'freedom to operate' to conduct biotech research and development (R&D) activities because of the existence of many patents on biotech products and processes held by MNCs. This has slowed down research partnerships and the flow of knowledge amongst interested research parties and has led to a negative impact on the quality of research carried out. The multiplicity of patents owned by MNCs, especially where the broad patents are granted on useful biotech information and technology or fundamental research processes, have stifled research and complicated or deterred useful and desirable follow-on research.

In all this way patent holders who are bound to be mainly MNCs will have the monopolistic rights and control over food in the world.

5.0. Conclusion

Arguably, patent holders have IPRs and the general public too has rights, all of which are at the same footing. As earlier stated, while TRIPS sets minimum standards, its article 27.3(b) infringes the right to food and the United Nations Sub-Commission has stressed that if implemented in its current form, the agreement will lead to severe consequences for the right (among others) to food of people. A patent system for protection of new plant varieties would most certainly endanger the right to food. Yet the precedents so far are legalizing such patents. It is my proposal that the old position where new life forms could not be subject to patents be reinstated. A sui generis system like the one offered under the UPOV conventions stands to serve both the developed and developing countries by opening more possibilities and being adaptable to the specific environment of application. But even in the typical language of the TRIPS agreement and other relevant international conventions, a lot is left to the discretion of each state.

The state has an obligation in the first place to respect the freedom of people to access food in their own ways and especially not hinder their existing access to food. Most people grow or buy their own food, and governments should provide policies that allow this. In the second place, the state shall protect its people against others trying to deprive them of their access to food. As stated earlier this requires legislation and enforcement of the protection. The state has an obligation to keep legislation that is necessary for the enjoyment of the right to food. It must also make sure that when entering into international agreements that the right to food is not endangered in any way. Therefore the state has an obligation to make sure that any law it makes or any agreement or treaty it enters into does not interfere with its peoples right to food.

In this context, the state also has an obligation to ensure that if it makes the option to allow GM food in, then such food should be safe for its people or else it shall be in violation of the requirements for food security and the right to food. Noteworthy here is the influence of MNCs on state policy. While MNCs have social responsibility towards the people, many times they influence government policy to protect their profit interests and sacrifice social responsibility. Governments are under obligation to protect their peoples rights in any situation.

Through the biotechnology of GM foods lies the potential to solve many of the world's hunger and malnutrition problems, and to help protect and preserve the environment by increasing yield and reducing reliance upon chemical pesticides and herbicides. Yet there are many challenges ahead for governments, especially in the areas of health, safety testing, regulation, international policy and food labelling.

Genetic engineering may be the inevitable wave of the future and it may be difficult to ignore a technology that has such enormous potential

benefits. However, we must proceed with caution to avoid causing unintended harm to human health and the environment as a result of our enthusiasm for this powerful technology. As of now, unless a government is clearly committed to its people in order to make a meaningful balance between IP rights and other human rights, there is no satisfactory guarantee.

BIBLIOGRAPHY

Books

Asbjorn Eide, Catarina Krause and Allan Rosas(eds). Economic, Social and Cultural Rights. 2nd ed. 2001. Kluwer Law International. Hague.

Background Reading Material on Intellectual Property. 1988. WIPO Publication. Geneva.

Correa, Carlos M. Intellectual Property Rights, the WTO and Developing Countries: The TRIPS Agreement and Policy Options

Drahos Peter. Intellectual Property and Human Rights. 1999.IPQ. No. 3. Sweet and Maxwell. London.

Erbisch, F.H. and Maredia, K.M. (eds). Intellectual Property Rights in Agricultural Biotechnology. 1998. CAB International. New York and London.

Frederick Abbot, Thomas Cottier and Francis Gurry. International Intellectual Property Systems: Commentary and Materials. Part One. 1999. Kluwer Law International. Hague.

Gudmundur Alfredsson and Eide Asbjorn: The Universal Declaration of Human Rights, A Common Standard of Achievement. Martinus Nijhoff Publishers, The Hague- Netherlands.

Gudmundur Alfredsson, Jonas Grimheden, Bertram G. Ramcharan &Alfred Zayas de (eds). International Human Rights Monitoring Mechanisms: Essays in Honour of Jakob Th. Möller. 2001. Kluwer Law International. Hague.

Johnson, Stanley P. The Earth Summit: The United Nations Conference on Environment and Development (UNCED). 1993. International Environmental Law and Policy Series. Graham and Trotman/Martinus Nijhoff. London.

Katarina. Tomasevski: The Right to Food, Guide through applicable International Law (1987) Martinus Nijhoff Publishers.

Malanczuk, P. Akehurst's Modern Introduction to International Law. 1997. 7th revised edition. Routledge. London and New York.

Mellander, Goran and Alfredsson, Gudmundur (eds). The Raoul Wallenberg Compilation of Human Rights Instruments. 1997. Kluwer Law International. Martinus Nijhoff Publishers. Hague/London/Boston.

Mugabe, John, Intellectual Property Protection and Traditional Knowledge: An Exploration in International Policy Discourse (1999), African Centre for Technology Studies (ACTS). ACTS Press. Biopolicy International Series. No. 21. Nairobi Kenya.

Ng'ong'ola Clement: The World Trade Legal Order and Developing Countries: An assessment of important concessions and commitments, with special reference to sub Saharan Africa"

Rachel Carsons 'Silent Spring'

R. Bud authoritative study: "The uses of life. A history of biotechnology" (1994) Cambridge University Press, ISBN:0 521 47699 2 (Paperback).

World Intellectual human Property Organisation/Office of the United Nations High Commissioner for Rights: Intellectual Property and Human Rights, (WIPO 1999), reprinted 2000.

Pistorius, Robin and vanWijk, Jeroen. The Exploitation of Plant Genetic Information-Political Strategies in Crop Development. 1999. CAB International. New York & London.

Posey, Darrel. A and Dutfield, Graham. Beyond Intellectual Property:Toward Traditional Resource Rights for Indigenous Peoples and Local Communities. 1996. International Development Research Centre. Ottawa.

Shiva, Vandana. Protect or Plunder? Understanding Intellectual Property Rights. 2001. Zed Books. London and New York.

Transnational Corporations and Management Division. Department of Economic and Social Development. Intellectual Property Rights and Foreign Direct Investment. United Nations, New York 1993.

Vries De, J and Toenniessen, G Securing the Harvest: Biotechnology, Breeding and Seed Systems for African Crops. 2001. CABI Publishing. New York and London.

Weeramantry, C.G. (eds) Impact of Technology on Human rights: Global Case Studies. 1993, UN University. UN University Press. Tokyo, Japan.

Weeramantry, C.G. (eds) Human Rights and Scientific and Technological Development. 1990. UN University. UN University Press. Tokyo, Japan.

Westerlund, Li Biotech Patents: Equivalency and Exclusions under European and US Patent Law. 2002. Kluwer Law International. Hague.

World Intellectual Property Organisation. Intellectual Property Reading Material. 1995. WIPO Publication. No. 476 (E). Geneva.

WIPO Worldwide Academy. COLLECTION OF DOCUMENTS ON INTELLECTUAL PROPERTY. 2001. Compiled by WIPO Worldwide Academy.

Articles

Barton, J: Biotechnology and Trips: Issues and Options for Developing Countries. (2000). Graduate Institute of International Studies. PSIO Occasional paper. WTO Series Number 03. Geneva.

CIDSE: 'Biopatenting and the threat to Food Security,' 2000 (www.cidse.org/pubs/tg1 pppre.html).

Deborah B Whitman: 'Genetically Modified Foods: Harmful or Helpful' at p. 2,
(www.csa.com/hottopics/gmfood/oview.html)

'Genetically Modified Foods and Organisms' available at (www.ornl.gov/sci/techresources/Human_Genome/elsi/gmfood)

Mekoaur Ali, A Global Instrument on Agro-biodiversity: The International Treaty on Plant Genetic Resources for Food and Agriculture. January 2002. FAO Legal Papers Online#24 available at (www.fao.org/Legal/pub-e)

Nathan Batallion: '50 Harmful Effects of Genetically Modified Foods' Available at (www.cqs.com/50harm.htm)

National Centre for Biotechnology Education guide :"The Technology-Genetically Modified Food" Available at (www.ncbe.reading.ac.uk/NCBE/GMFOOD/technology

Oram Julian: 'The TRIPS Agreement and its Implications for Food Security' (www.voice.buz.org/biopatenting/Jorran.html).

Ostergard Robert L Jr: 'Intellectual Property: A Universal Human Right' Human Rights Quarterly, Vol. 21, No. 1(1999).

Tansey Geoff: 'Trade, Intellectual Property, Food and Bio-diversity' Quaker Peace &Service, London,1999 (www.Quaker.org/quno).

Via Campesina: 'Food Sovereignty, a future without hunger' (www.sdnhon.org.hn/miembros/via/soberania_en.html).

Web pages

UPOV: 'What is UPOV' (www.upov.gov.org),

CUTS Briefing Paper: 'TRIPS, Biotechnology and Global Competition' available at (www.www.cuts-india.org/1998-2.htm

Documents

Economic and Social Council. Intellectual Property Rights and Human Rights. Sub-Commission on Human rights Resolution 2000/7. E/CN.4/SUB.2/RES/2000/7.

European Union Directive 98/44 on legal protection of biotechnological inventions

General Comment No. 3(1990). Nature of state obligations under article 2(1). Report of the Committee on Economic, Social and Cultural Rights. UN Doc.E/1991/23. p.83-87

General Comment No. 12(1999). 'Right to adequate food.' Report of the Committee on Economic, Social and Cultural Rights. UN Doc. E/2000/22.

Cases

Diamond, Commissioner of Patents and Trademarks vs Chakrabarty, 447 US 303 (1980).

Ex parte Hibberd 227 USPQ 443 (1985)