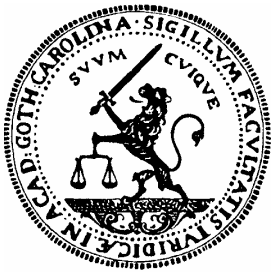

FACULTY OF LAW
Lund University

Artur Appazov

New Plant Variety Protection, Plant Genetic Resources for Food and Agriculture, and Access to Adequate Food in Developing World's 'Melting Pot'

Master thesis
20 credits (30 ECTS)

Mpazi Sinjela

Master´s Programme in Human Rights and Intellectual Property Rights Law

Autumn 2007

Contents

SUMMARY 1

ABBREVIATIONS 2

1 INTRODUCTION 5

2 THE PROBLEMATICS OF NEW PLANT VARIETY PROTECTION AND PLANT GENETIC RESOURCES FOR FOOD AND AGRICUTURE 8

2.1 New plant variety protection 8

2.2 Key facts of debates over plant genetic resources' 'legal engagement' 11

2.3 The rights confrontation 14

2.3.1 Breeders and farmers ***14***

2.3.2 North and South ***15***

2.4 Human rights ties of intellectual property rights 16

2.5 Developing world and access to food 17

3 THE ANALYSIS OF INTERNATIONAL LEGAL TOOLKIT, ITS CONGRUITY AND ANTILOGY 20

3.1 The toolkit 20

3.1.1 International Convention for the Protection of New Varieties of Plants ***20***

3.1.2 Convention on Biological Diversity and Bonn Guidelines ***23***

3.1.3 Trade Related Aspects of Intellectual Property Rights Agreement ***25***

3.1.4 International Treaty on Plant Genetic Resources for Food and Agriculture ***27***

3.1.5 The Universal Declaration of Human Rights and International Covenant on Economic, Social and Cultural Rights ***29***

3.2 The congruity and antilogy 32

3.2.1 The congruity ***32***

3.2.1.1 CBD and ITPGR 32

3.2.1.2 TRIPS Agreement and UPOV Convention 32

3.2.2 The antilogy ***34***

3.2.2.1 CBD versus TRIPS 34

3.2.2.2 ITPGR versus TRIPS 37

3.2.2.3 ICESCR versus TRIPS 38

4 TRIPS *SUI GENERIS* ALTERNATIVES 41

4.1 Analysis of TRIPS-pled *sui generis* system 41

4.1.1 Requirement to protect all plant varieties 41

4.1.2 Requirement to grant a plant breeder an IPR 42

4.1.3 Requirement to provide national treatment and MFN treatment 42

4.1.4 Requirement to contain enforcement procedure 43

4.2 Compulsory licensing alternative 43

4.3 Other alternatives 44

5 MAIN INTERNATIONAL FORA 48

5.1 WIPO 48

5.1.1 WIPO and Human Rights 48

5.1.2 The WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore 48

5.2 The FAO Commission on Genetic Resources for Food and Agriculture 49

5.2.1 The Global System on Plant Genetic Resources 50

5.2.2 The Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture; and the Leipzig Declaration 51

5.2.3 Intergovernmental Technical Working Group on Plant Genetic Resources for Food and Agriculture 51

6 EXPERIENCE OF PLANT VARIETY PROTECTION IN DEVELOPING WORLD 53

6.1 Africa 53

6.1.1 African Union and the Model Law 53

6.1.2 South Africa 56

6.2 Asia 57

6.2.1 China 57

6.2.2 India 58

6.3 Latin America 61

7 CONCLUDING WORDS 63

SUPPLEMENT A 65

SUPPLEMENT B 66

BIBLIOGRAPHY 68

Summary

Being a very important part of property *per se*, intellectual property is performing the duty of securing social development by providing incentives for inventors to create and thus benefit society. It is of no doubt this property should be protected. However, this protection should not encroach upon other rights, such as human rights, in particular the right to adequate food; thus, intellectual property should be in adequate balance with human rights.

The intertwining of intellectual property rights and human rights takes place, *inter alia*, in the issue of new plant variety protection. New plant varieties can be legally protected by the current legal regime stipulated for the most part by the Trade Related Aspects of Intellectual Property Agreement together with the so-called UPOV Convention. Once protected, the exclusive rights over the use of a variety belong to a breeder, the inventor of the variety. From that moment on, any third party to use the variety should involve in various financial charges in favour of the exclusive rights owner.

Many important species of plants provide humanity with food. The genetic sources of overwhelming majority of food plants are located in developing world. Rich agricultural and research companies, for the most part those of developed countries, that can afford extensive research in plant genetic engineering, take native plant species, modify them and protect by obtaining exclusive rights. Restrictive nature of plant variety protection implies, in the end, restriction to the access to food especially in developing countries, where local population is heavily dependant on traditional agriculture and local farmers are not able to carry the burden of royalties.

Current international legislation grants very strong protection of intellectual property rights in plant varieties. Necessity is to strike adequate balance between intellectual property rights and human rights by lifting robustness of intellectual property over plant varieties for food and agriculture.

Abbreviations

AU	African Union
CAN	*Comunidad Andina de Naciones* (Andean Community of Nations)
CBD	Convention on Biological Diversity
CGRFA	Commission on Genetic Resources for Food and Agriculture (FAO)
CHM	Common heritage of mankind
CIPR	Common Industrial Property Regime (CAN)
COP	Conference of Parties (CBD)
CPGR	Commission on Plant Genetic Resources (FAO)
EPC	European Patent Convention
EPO	European Patent Office
ESCR	Economic, social and cultural Rights
FAO	United Nations Food and Agriculture Organization
GATT	General Agreement on Tariffs and Trade
HCHR	UN High Commissioner for Human Rights
HRs	Human Rights
ICESCR	International Covenant on Economic, Social and Cultural Rights
IGC	Intergovernmental Committee (WIPO)
IP	Intellectual property
IPRs	Intellectual property rights
ITPGR	International Treaty on Plant Genetic Resources for Food and Agriculture

MFN	Most favoured nation
MS	Multilateral System of Access and Benefit-Sharing (ITPGR)
NGO	Non-governmental organization
OAU	Organization of African Unity
PGRs	Plant genetic resources
PPVFR	India's Protection of Plant Varieties and Farmer's Rights Act
PVP	Plant variety protection
RAFI	Rural Advancement Foundation International
TRIPS	Trade Related Aspects of Intellectual Property Rights Agreement
TNCs	Trans-national corporations
UDHR	Universal Declaration of Human Rights
UNEP	United Nations Environment Programme
UPOV	*Union Internationale pour la Protection des Obtentions Vegetales* (International Union for the Protection of New Varieties of Plants)
VCLT	Vienna Convention on the Law of Treaties
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

“What is food to one, is to others bitter poison.”
~ Lucretius ~

1 Introduction

There is no doubt the progress in agricultural genetic engineering has strong potency to unveil new horizons to better global food accessibility in modern world with growing population, the half of which, nearly three billion people, leave on less that USD two per day[1]. Genetically modified plants can be more efficient in actual yield capacity to provide more food; they can be resistant to pests and diseases that wither harvests and hamstring all efforts of developing countries' rural population in securing adequate food supplies. These new opportunities can serve as a powerful impulse to global civilization development.

It stands to reason that these efforts of genetic 'designing' involve enormous material, financial, and moral investments. To provide these investments for these research activities, an investor wills to be safe from unavailing economic results to be potent to bring investments in the future, *i.e.* to be willing to develop and create more and more for the benefit of society. For that matter a creator claims exclusive rights over his/her creation to control any use thereof by any third party.

Plant variety protection, as will be explained further, is however noted distinction in a way of achieving an ultimate product, a new variety that houses a creator's 'birthgiving' ingenuity. Not a single genetic engineer, whatever genius he/she carries, is capable of creating a biological life form, in particular a plant. The brightest merit of his/hers resolves itself into a 'modification' of already existing DNA sequence.

Adequate remuneration for the work carried out by a researcher in plant genetic alteration and the scope of exclusive rights thereover are becoming open to doubt as to its adequacy in context of some international instruments regulating plant variety protection in the presence of problems facing by developing world. Moreover, the virgin material for genetic modifications is for the most part plant life of the same developing world.

Developing countries find themselves in a very delicate situation when they have to decide whether to join all the conventions, treaties, and agreements that will let developed world dictate the rules of plant varieties protection and let the inflow of technologies from the developed countries and foster development with the risk of local population not being able to keep up with the requested level of protection, or simply not to join the instruments.

Holders of exclusive rights over new plant varieties that can benefit societies of developing world's grave situation are demanding the 'suffocating' level of protection, *i.e.* remuneration for their creations. It is

[1] Hunger Report 2007. Retrieved October 27, 2007, from Bread for the World Web site: http://www.bread.org/learn/hunger-reports/hunger-report-2007-download.html.

indeed the hunger is an overwhelming phenomenon shared by the entire humankind whether it is hunger for food or for money.

Meant to furnish the development of society, intellectual property rights, being a tool to various transnational actors, thus, are downgrading and omitting the fundamentality of human rights and human dignity they stand for, in the name of profit and corporate interests. Hence, the question of striking the equitable balance between IPRs and HRs is of paramount importance for the development of true civilization.

The development in plant variety protection legal arena for the last couple of decades shows little consideration of the rights that are attached to the outcomes of green revolution as intellectual property rights. Human right to adequate food and human dignity are placed in backyards of priority rights discussed by those who probably have never had an experience of hunger mortification and, what is more important, a deep understanding of the purpose of law and humanism and their intimate liaison.

Erstwhile being strangers, today intellectual property and human rights are becoming deeply interrelated. The purpose of this work is to clear up whether it is possible for developing countries under the current international intellectual property regime (especially set by TRIPS and UPOV) to come to balance with human rights, especially the right to adequate food (UDHR and ICESCR) and farmers' rights without harming development, *i.e.* stimulation of breeding by researchers and benefiting our society with new produce.

This work does not hold within its intentions to discuss specifically the issues of access to plant genetic resources and benefit sharing, traditional knowledge, biopiracy and biprospecting, but only will touch upon these issues, for in depth discussion thereof amount to an independent research. However, the wording of plant genetic resources will serve for the purpose of collective meaning of plant life and plant parts carrying the hereditary information known as DNA. This work will briefly touch upon such issues as sustainable use of biological diversity.

As well, this work will not specifically focus on patent protection of plant varieties but will consider the issue of protection *per se*, and will specifically examine *sui generis* alternative systems of intellectual property protection for plant varieties. The off-centering of patent protection is stipulated by its obvious challenging nature to societal interests such as right to food under examination in the given work.

The following chapter two of this work will provide for explanation of plant varieties and plant variety protection problematics, key facts of debates over plant genetic resources and its introduction to legal consideration. Chapter three will deal with in depth legal analysis of current legal instruments and their interrelations with each other discerning benefits and threats of the instruments to food accessibility, developing world

problems, threats to sustainable use of biological diversity posed by some international instruments and their relation to human rights. Chapter four will present analysis of alternatives to patent protection for plant varieties available under TRIPS Agreement. Chapter five will discuss positions of main international institutions concerned with intellectual property in plant variety protection problems. The institutions chosen are World Intellectual Property Organization (WIPO) and UN Food and Agriculture Organization (FAO). Chapter six will examine experience of developing world in plant variety protection revealing the ways of striking adequate balance between intellectual property rights and human rights. The last chapter, chapter seven, will conclude upon the entire work and suggest some recommendations in shifting legal regimes, as well as some practical suggestions of providing satisfaction to financial interests of breeders while lifting heavy financial burden from developing societies by establishing an intergovernmental institution financing researches in crucial issues of plant genetic resources for food and agriculture.

To mention is that by no means does this work derogate from the importance of intellectual property rights but reaffirms its importance to the development of societies when in equitable balance with other vital values of humanity such as human rights.

2 The problematics of new plant variety protection and plant genetic resources for food and agricuture

To have a better understanding of the problematics under discussion in this work, one has to have fair understanding of the concerned subject matter pertaining to protection, *i.e.* plant varieties with the brief explanation of which this chapter starts.

2.1 New plant variety protection

The plant kingdom is vast and has its own ranking system comprising many segments and sub-segments. The segment which is most familiar to many people is the 'species'; however, the species level has its seat quite low down the classification of the plant kingdom. The most commonly used ranks in classification of plants are, in descending order, Kingdom, Division, Class, Order, Family, Genus and Species. Thus, in general, each species belongs to a genus, each genus belongs to a family, etc. These ranks are called taxonomic groups or 'taxa'[2] (singular: taxon) for short.[3]

Although the rank of species is an important botanical classification, it is apparent that plants can very much differ within a species. Farmers and growers find themselves in need of plants which are adapted to the local environment and which are suited to the cultivation practices employed. Therefore, farmers and growers use a more precisely defined group of plants, selected from within a species, called a 'plant variety'.[4]

In recent years genetically engineered, genetically modified, and transgenic plants have had a notable impact on farming across the globe. New breeds of plants, in particular crops, combining such capabilities as

[2] For example:
Division: Spermatophyta
Class: Liliopsida (Monocotyledonae)
Order: Poales
Family: Poaceae
Genus: Triticum
Species: Triticum aestivum L. (Soft Wheat)
[The UPOV System of Plant Variety Protection. Retrieved October 10, 2007, from UPOV Web site: http://www.upov.int/en/about/upov_system.htm#what_is_a_pv].
[3] The UPOV System of Plant Variety Protection. Retrieved October 10, 2007, from UPOV Web site: http://www.upov.int/en/about/upov_system.htm#what_is_a_pv.
[4] *Ibid*.

higher yield, herbicide tolerance or insect resistance, offer promising prospects of higher productivity for farmers.[5]

The major part of these genetically engineered plants are created by a small number of transnational corporations (TNCs) which have come to collar seed markets by buying up seed companies and smaller competing biotechnology companies. Today about ten leading seed companies dominate 30 percent of the world seed market.[6] These TNCs protect their commercial interests by protecting the manipulated genetic strains and patenting the processes for their creation. In fact, it can be alleged that these TNCs had a key influence on the development of current domestic and international regimes for the protection of intellectual property and plant varieties in particular.[7]

This regime is for the most part stipulated by Trade Related Aspects of Intellectual Property Rights Agreement (TRIPS) and International Convention for the Protection of New Varieties of Plants (UPOV), which impose relatively high obligations in intellectual property on developing countries. The existing intellectual property regime proposes to use one of two available options of plant varieties protection: patent granting or *sui generis* system of protection. The two international instruments will be thoroughly analyzed below under respective sections.

In brief, the meaning of the TRIPS regime is to provide for the protection of plant varieties at the same time allowing Parties to lift protection for plants. Interestingly, however, that it is very hard, if not impossible, to find an 'independent' plant not belonging to a "grouping within a single botanical taxon of the lowest known rank …", as a plant variety defined by UPOV Convention[8]; *i.e.* a plant that would not belong to a plant variety. Moreover, plant varieties of some species can be based upon a single plant.[9] Thus, every plant can be protected by TRIPS by means of plant variety protection (PVP) by protecting the variety the plant belongs to.

---

[5] Straub, Peter (Winter 2006). Farmers in the IP Wrench - How Patents in Gene-Modified Crops Violate the Right to Food in Developing Countries? *Hastings International and Comparative Law Review, 29*, Retrieved September 21, 2007, from http://international.westlaw.com.

[6] *Ibid*.

[7] *Ibid*.

[8] This definition used in UPOV Convention is a common scientific definition.

[9] Different types of plant variety have been developed, depending upon the physiology of the plants of each species and the ways in which the plants of the species can be reproduced. For example, varieties of rose and potato can be reproduced vegetatively, that is to say, can be reproduced by using a part of a plant as the basis for producing another complete plant. Varieties of grasses and most vegetables and cereals are reproduced sexually, that is by pollination of the female part of a flower (the stigma) by pollen from the male part of a flower (the anther). Here, however, one must make a distinction. The plants of some species, for example wheat, will tolerate, through successive generations, the fertilization of the stigma by pollen from the anthers of the same flower or from another flower on the same plant without loss of vigor. Plant varieties of such species can be based upon a single plant or on a small number of plants which will reproduce themselves precisely through successive generations. All the plants of a variety of this kind, known as 'self-pollinated' varieties, will be genetically the same or very similar.

Genetically modified rice, for example, can introduce a new variety and this new variety can include rice cultivars that had been in existence long before the new variety came into being; these old cultivars are called landraces[10]. It means that current legal regime reads that the rice landrace that has been cultivated by centuries can now be under the protection, and the breeder (or a TNC to which the rights belong) has the exclusive rights over this variety and this particular cultivar. In such a manner the landrace, technically, can no longer be available for free use by local farmers. Interesting is that the initial DNA to produce a new variety can be taken from the very landrace.

Since the moment the breeder gains exclusive rights over a variety, third parties have to pay royalties to the breeder to get access to genetic resources of protected cultivars; simply – to be able to grow or anyhow use the plant.

A different situation emerges when farmers of developing countries, having bought protected seeds, cultivate plants that were indeed genetically engineered and thus constitute an invention and should be protected by intellectual property. These plants are in possession of outstanding abilities for higher yield, herbicide tolerance, or insect-resistance, and thus can furnish the needs of population in a much more effective manner. The protection of these plants is justified by the intellectual and financial investments of the breeder. However, the protection should be in strict accord with proportionality of remuneration and restrictiveness of the rights granted.

The grant of intellectual property rights (IPRs) is, *inter alia*, intended to provide adequate stimuli for creators to invest their time, resources and intellectual capital needed to create intellectual property products which benefit a society and thus increase its prosperity. Meanwhile, the ultimate goal of legal protection should not be remunerative reward for creators but the enhancement of social welfare through securing access to the ideas and information contained in intellectual property products.[11]

Ultimately, the grant of exclusive rights to plant breeders is designed, *if designed*, to benefit the society and the very rights granting. It provides motivation for private research and productive involvement into new

---

[The UPOV System of Plant Variety Protection. Retrieved October 10, 2007, from UPOV Web site: http://www.upov.int/en/about/upov_system.htm#what_is_a_pv].

[10] The term 'landraces' is used to describe plants that are selected by traditional farmers from wild populations
[Straub, Peter (Winter 2006). Farmers in the IP Wrench - How Patents in Gene-Modified Crops Violate the Right to Food in Developing Countries? *Hastings International and Comparative Law Review*, *29*, Retrieved September 21, 2007, from http://international.westlaw.com].

[11] Helfer, Laurence R. (2002). Intellectual Property Rights in Plant Varieties: An Overview with Options for National Governments. *FAO Legal Papers Online*, *32*, Retrieved September 26, 2007, from http://www.fao.org.

breeding techniques, thereby reducing the need for governments to subsidizing these activities. It stimulates the development of new and valuable plant varieties for use by farmers. And it facilitates the society's development of agriculture.[12]

It is, therefore, essential and very important to provide an effective system of plant variety protection. However, such protection should be in balance with essential human rights, such as, for instance, as right to food. The UPOV Act 1991 (discussed below) prohibits farmers from, *inter alia*, reproducing seeds cultivated on their fields from protected varieties, which means farmers should buy new seeds for every harvest. This situation limiting farmers' rights is unacceptable for developing countries due to economic difficulties and can lead to severe food shortages in these countries.

2.2 Key facts of debates over plant genetic resources' 'legal engagement'

Agriculture is unquestionably a global public good, in particular sustainable agriculture that provides diverse and widely available food supply. The history of agriculture up to the past century can be characterized by non-including seed germplasm to IP article of commerce and the ability of farmers to access it freely and without restriction thus constituting selective process that produced the varieties of major food crops. An individual seed could be sold and owned, but the phenotypic and genotypic information it contained were not seen as something one can own, for plant scientists and geneticists began unlocking the secrets of the seed in the twentieth century.[13]

Plant genetic resources (PGRs), or seed germplasm, underwent a dramatic change in legal treatment from 1982 to 2001. Prior to 1982, 'raw' seed germplasm was generally and legally regarded as 'common heritage of mankind' (CHM). With some exceptions beginning in the 1930s, legal regime for seed germplasm was something of the same kind as the one for an ocean seabed that is open to all and owned by none. Thereby, farmers, plant breeders, and agricultural scientists could freely access and use raw seed germplasm without qualification.[14]

In 1982 the UN Food and Agriculture Organization (FAO) promulgated the International Undertaking on Plant Genetic Resources (IUPGR). The FAO had become a ganglion for debates between the

[12] Helfer, Laurence R. (2002). Intellectual Property Rights in Plant Varieties: An Overview with Options for National Governments. *FAO Legal Papers Online*, *32*, Retrieved September 26, 2007, from http://www.fao.org.
[13] Aoki, Keith (March, 2007). Distributive and Syncretics Motives in Intellectual Property Law (with Special Reference to Coercion, Agency, and Development). *U.C. Davis Law Review*, *40*, Retrieved September 20, 2007, from http://international.westlaw.com.
[14] *Ibid*.

countries of the global North and the global South regarding PGRs exploitation. In 1983 FAO adopted the IUPGR and established the FAO Commission on Plant Genetic Resources (CPGR). The IUPGR and the CPGR were pioneered by a group of developing countries with support of a range of NGOs.[15]

The IUPGR was a nonbinding arrangement that set out rules and standards for exchanging and conserving seeds and plant tissues. Importantly, the IUPGR adopted the position that PGRs were to be considered as CHM. The IUPGR's 'common heritage' principle became very controversial due to its extremely broad definition of PGRs subject to the IUPGR undertaking. Commercial plant varieties protected by breeders' rights and plant patents were to be treated in the same way as traditional landraces and wild plants – as 'common heritage'. Therefore, these commercial plant varieties would be freely accessible to farmers and breeders around the world, and the exclusive right holders would experience negative profit.[16]

Some countries categorically refused to participate in the IUPGR, resulting in a deadlock until 1989. Later on, the developing and developed countries reached a preliminary agreement on three principles related to PGRs. First, the parties came to a consensus that plants protected by plant variety protection rights would not be considered freely accessible – recognition of valid IP rights in plant varieties. Second, the parties settled that CHM principle or free accessibility to farmers' landraces and their wild and weedy relatives did not mean access free of charge. Instead, it was considered doable to design an arrangement under which third parties aiming to use local germplasm could be obligated to pay for plant tissue and seeds collected in a particular country's territory. Lastly, the parties adverted to the then vague idea of 'farmers' rights'. These rights were undefined, but the FAO referred to some kind of acknowledgment of the thousands of years of farmers' efforts to domesticate current agricultural staple crops and varieties.[17]

The idea of 'farmers' rights' was introduced in 1985 by the Rural Advancement Foundation International (RAFI), a Canadian NGO. The farmers' rights proposal was meant to represent concerns over genetic erosion and the North-South 'gene drain'. As envisaged by RAFI, farmers' rights were a new category of collective IP right. These rights were meant to answer plant breeders' rights and to allow farmers to receive compensation from an international genetic conservation fund to be administered by the FAO. Farmers' rights advocates focused on the following four issues: (1) the right to grow, improve, and market local varieties and their products; (2) the right to access improved plant varieties and use farm-saved seeds of

[15] Aoki, Keith (March, 2007). Distributive and Syncretics Motives in Intellectual Property Law (with Special Reference to Coercion, Agency, and Development). *U.C. Davis Law Review, 40*, Retrieved September 20, 2007, from http://international.westlaw.com.
[16] *Ibid*.
[17] *Ibid*.

commercial varieties for planting and exchange; (3) the right to be compensated for the use of local varieties in the development of new commercial products by outsiders; and (4) the right to participate in decision-making processes related to acquiring, improving, and using PGRs.[18]

The ongoing debate over PGRs must be understood in the context of two multilateral agreements. The first is the Convention on Biological Diversity (CBD), adopted at the 1992 UN Conference on Environment and Development in Rio de Janeiro, Brazil. The second is TRIPS, part of the General Agreement on Tariffs and Trade (GATT), which was finalized in 1992 in Marrakesh, Morocco. TRIPS was signed by 125 countries in 1994 and it mandates PGRs to enjoy plant variety protection, patent, or effective protection under a *sui generis* system. This meant that TRIPS was at conflict with the CBD and undermined many gains the developing world achieved at the 1992 UN Conference just two years earlier.[19]

Although the CBD aimed to conserve biodiversity, it carries direct implications on the matter of IP rights in PGRs. The CBD was a multilateral agreement resulting from environmental concerns in the Organization for Economic Cooperation and Development (OECD) member countries. The CBD adopted the position that economic stimuli are necessary in order to encourage developing countries to conserve their biodiversity and disavow practice of quick gains through such activities as deforestation and cash crops resulting in devastation of biodiversity. Even though the CBD did not focus on PGRs for food and agriculture, it addressed general concerns over the conservation of all plants in the global environment. Some of concerns surfaced in the FAO debates over the IUPGR also appeared in the CBD negotiations. These concerns are the propriety of granting IP rights over life forms, and technology transfer issues regarding access to technologies necessary to utilize the benefits of such life forms.[20]

The CBD differed in one key from the IUPGR in that the CBD did not adopt a common heritage approach in regard to biological resources but applied the idea that the 'countries of origin' of biological resources exercised sovereignty over any form of biological life within their national boundaries. With PGRs characterized as species of sovereign national property, the CBD conceived that this sovereign property was a basis for informed consent (prior to extraction and exploitation) and benefit sharing.[21]

In 1986, the initial focus of Uruguay Round, and specifically TRIPS, was an attempt by developed nations to secure multilateral protection for

---

[18] Aoki, Keith (March, 2007). Distributive and Syncretics Motives in Intellectual Property Law (with Special Reference to Coercion, Agency, and Development). *U.C. Davis Law Review, 40,* Retrieved September 20, 2007, from http://international.westlaw.com.
[19] *Ibid*.
[20] *Ibid*.
[21] *Ibid*.

new technologies, pharmaceuticals, and copyrighted media works against unauthorized imitation or duplication. However, by 1990, IP protection for biological organisms, including plants, had appeared as a foremost negotiating point, just as several, newly patented biotech inventions began emerging on the market. At the same time, the phenomenal wave of mergers and acquisitions in the chemical and pharmaceutical economic sectors, which began in the 1970s, continued with these companies quickly moving into the areas of plant genetic engineering, plant breeding, and crop development. Companies also aggressively acted to secure some form of global IP protection for their biotech innovations. The ardour for more expansive IP protection was opposed by some developing countries against strengthening international patent law. These countries were committed to exclusion of plant or animal varieties from patent, if required on particular public interest grounds.[22]

Lastly, in 2001, the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGR) was created. The ITPGR recognized germplasm as 'sovereign property', reaffirmed the commitment to farmers' rights, recognized a right to equitable benefit sharing, and granted the right to participate in decision-making at national levels on matters related to PGRs use and conservation.[23]

2.3 The rights confrontation

As mentioned above, the appearance of the notion of farmers' rights was featured as an answer to the dominance of breeders' rights creating a rigid disbalance in *lex lata* at that time. In its turn, the said disbalance represents *status quo* between Northern and Southern countries, for technologically rich North can be regarded as an exclusive rights holder while biologically rich South – a tilting farmer.

2.3.1 Breeders and farmers

The concept of farmers' rights was developed to address the contributions of traditional farmers, particularly in the developing world, to the preservation and improvement of plant genetic resources. FAO Resolution 5/89 defines farmers' rights as "rights arising from the past, present and future contributions of farmers in conserving, improving and making available plant genetic resources, particularly those in centers of origin/diversity". Such rights are also recognized in Article 9 of the ITPGR.[24]

[22] Aoki, Keith (March, 2007). Distributive and Syncretics Motives in Intellectual Property Law (with Special Reference to Coercion, Agency, and Development). *U.C. Davis Law Review*, *40*, Retrieved September 20, 2007, from http://international.westlaw.com.
[23] *Ibid*.
[24] Helfer, Laurence R. (2002). Intellectual Property Rights in Plant Varieties: An Overview with Options for National Governments. *FAO Legal Papers Online*, *32*, Retrieved September 26, 2007, from http://www.fao.org.

The plant breeders are granted with exclusive rights that grant to the product's owner the power to exclude all third parties from engaging in the activity that the right covers (such as reproducing or modifying the product or distributing it to others). As has been mentioned, it is the exclusivity of the rights granted that allows IPR owners to recoup the investment of time, money and resources required to create intellectual property products.[25]

Farmers' rights are in tension with IPRs for plant breeders because many farmers and farming communities do not claim exclusive rights in the cultivated landraces and plant varieties they have cultivated over time.[26] Moreover, some international instruments, as will be shown below, provide for the level of protection which prevents farmers from such activities as reproducing the plants, for example wheat, that they (farmers) bought from IPRs owners, which makes every harvest payable to the breeders of the plant grown. This situation, in is turn, can be ministerial to the aggravation of social rights of the developing world population, such as right to food and adequate standard of living.

2.3.2 North and South

The technologically rich developed countries located for the most part in the Northern Hemisphere, and the biodiversity rich developing countries located primarily in the tropics and Southern Hemisphere are in a state of constant antagonism in regard to PGRs and appropriate legal regime governing them. For example, the United States initially refused to sign (and still has not ratified) the CBD, positing that it would impair American intellectual property rights, and that it conceives intellectual property rights as a constraint to the transfer of technology rather than as a prerequisite.[27]

While farmers in India, on the contrary, reacted strongly to the successful conclusion of the TRIPS negotiations, mounting increasingly aggressive political demonstrations to protest, in particular, against the requirement in Article 27.3 (b) of TRIPS that protection is to be extended to plant varieties by patents or an effective *sui generis* system of protection or any combination of the two. The demonstrators argued for collective, not individual control over seeds and plants. They revoiced widespread concerns in the developing world over 'gene piracy', whereby researchers and agricultural and pharmaceutical companies from developed countries obtain IP protection on inventions based on genetic resources from the developing world, while the developing world is burdened with the cost of

[25] Helfer, Laurence R. (2002). Intellectual Property Rights in Plant Varieties: An Overview with Options for National Governments. *FAO Legal Papers Online*, *32*, Retrieved September 26, 2007, from http://www.fao.org.
[26] *Ibid*.
[27] McManis, Charles R. (Summer 2003). Intellectual Property, Genetic Resources and Traditional Knowledge Protection: Thinking Globally, Acting Locally. *Cardozo Journal of International and Comparative Law*, *11*, Retrieved September 29, 2007, from http://international.westlaw.com.

preserving biodiversity and yet deprived of the opportunity to enjoy the share in its benefits.[28]

2.4 Human rights ties of intellectual property rights

Human rights and intellectual property, two seemingly so different bodies of law, are now more and more becoming increasingly interrelated fellows. For decades the two subjects had been developing in practical isolation from each other. But in the last few years, international legal activities have begun to map previously unfamiliar intersections between intellectual property law on the one hand and human rights (HR) law on the other.[29]

A review of the lawmaking process in some international fora engaged with IP and HR reveals two different conceptual approaches to the human rights-intellectual property relationships. These two approaches are based upon drastically different normative foundations and they offer clashing prescriptions for how to structure the rights and obligations.[30]

The first approach views human rights and intellectual property as being in fundamental conflict. This approach sees strong intellectual property protection as undermining, and therefore as incompatible with, a broad spectrum of human rights obligations, especially in the area of economic, social, and cultural rights (ESCR). The prescription that proponents of this approach advocate for resolving this conflict is to recognize the normative primacy of human rights law over intellectual property law in areas where specific treaty obligations conflict.[31]

The second approach to the interrelation of human rights and intellectual property sees both areas of law as concerned with the same fundamental question: defining the appropriate range of private monopoly power – exclusive rights – that gives authors and inventors a sufficient stimulus to create and innovate, while securing that the consuming public has adequate access to the fruits of their efforts. This school views human rights law and intellectual property law as fundamentally compatible, although often disagreeing over where to strike the balance between incentives on the one hand and access on the other.[32]

The products of the human mind are marked with the personality of their creator, thus enduing him/her with moral and economic claims to

---

[28] *Ibid*.
[29] Helfer, Laurence R. (2003). Human Rights and Intellectual Property: Conflict or Coexistence? *Minnesota Intellectual Property Review*, *5,* Retrieved September 17, 2007, from http://international.westlaw.com.
[30] *Ibid*.
[31] *Ibid*.
[32] *Ibid*.

exploit those products to the exclusion of third parties. Under this view, legal protection takes its rise from a state's commitment to protect human rights, a fact reflected in the wording of Article 27 of the Universal Declaration of Human Rights (UDHR), which guarantees to everyone "the right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author".[33] Support for these rights also finds expression in virtually matching language in the International Covenant on Economic, Social and Cultural Rights (ICESCR), an international treaty adopted almost twenty years later that makes the UDHR's economic and social guarantees binding as a matter of treaty law.[34]

Noticeably, human rights law's incorporation of the rights of creators and inventors has not been 'loved' back in the international intellectual property system. No references to 'human rights' come into view in multilateral treaties such as the Paris, Berne, and Rome Conventions, nor do they appear in the more recently adopted TRIPS Agreement. These treaties continually describe the legal protections for authors, inventors and other intellectual property owners as 'rights', 'private rights', and 'exclusive rights', phrases that may appear to suggest a camaraderie of objectives between the two legal regimes.[35]

ESCR are the most expansive and, for many countries, the most controversial. Whereas civil and political rights allocated in International Covenant on Civil and Political Rights (ICCPR) are negative liberties that require government officials to refrain from particular actions. ESCR obligate governments to provide minimum levels of subsistence and wellbeing to individuals and groups. Achieving these goals involves positive undertakings that often have significant financial consequences and require difficult compromise among competing categories of rights holders and other claimants. These positive obligations also create broad areas of overlap, and are of potential conflict, with international intellectual property protection regulations.[36]

2.5 Developing world and access to food

In developing world, farmers with small produce turnover play a significant role in domestic food production. The major agricultural biotechnology TNCs are now aiming for these countries' seed markets. They claim that new crop varieties could play a key role in combating hunger and malnutrition by boosting the yield of small farmers and developing crops

[33] Helfer, Laurence R. (2002). Intellectual Property Rights in Plant Varieties: An Overview with Options for National Governments. *FAO Legal Papers Online*, *32*, Retrieved September 26, 2007, from http://www.fao.org.
[34] Helfer, Laurence R. (March, 2007). Toward a Human Rights Framework for Intellectual Property. *U.C. Davis Law Review*, *40*, Retrieved September 17, 2007, from http://international.westlaw.com.
[35] *Ibid*.
[36] *Ibid*.

that address the special needs of malnourished people, such as vitamin-rich grains, known as 'golden rice'. This allegation is heavily contested by experts who say that the cause of hunger is in most cases not the overall lack of food, but the lack of accessibility. In the case of the 2005 famine in Niger, for example, the famine resulted from a boom in food prices on the regional markets combined with a collapse of purchasing power of Niger's pastoralists due to a drop in livestock prices. In fact, 80 percent of the people suffering from hunger live in food exporting countries.[37] One prime example is India, which has 320 million hungry people despite the fact that over 60 million tons of food grains were available in silos in 2001.[38] In addition, the low productivity of these farmers cannot be ascribed to the lack of a 'miracle crop', but to the overall macroeconomic situation and lack of market access, which prevent higher productivity.[39]

Small farmers generally have no financial resources and consequently do not purchase seeds but instead rely on the cultivation of wild varieties and the saving and exchange of seeds. Once they start cultivating protected crops however, the license agreements they will have to sign under new IP regimes would put them under an obligation to buy new seeds every season if their country is a party to some international instruments discussed further.[40]

At the same time, in order to protect patents, TNCs exercise political influence to open up developing world for their products and secure a level of intellectual property protection akin to the level of protection they enjoy in developed countries.[41]

It can also be expected that in developing world, where the wild ancestors of crop plants can still be found, manipulated DNA from genetically modified varieties will contaminate other crop varieties[42], especially landraces. Due to semi-literacy and the lack of information, small farmers in developing world will be unable to take safety measures against the contamination of these other varieties. In 2001 it was discovered that landraces of maize in Mexico had already been contaminated by transgenic DNA from genetically modified maize varieties from the United States even though a national moratorium against genetically engineered crops had been in place since 1998.[43]

---

[37] Straub, Peter (Winter 2006). Farmers in the IP Wrench - How Patents in Gene-Modified Crops Violate the Right to Food in Developing Countries? *Hastings International and Comparative Law Review*, *29*, Retrieved September 21, 2007, from http://international.westlaw.com.
[38] *Ibid*.
[39] *Ibid*.
[40] *Ibid*.
[41] *Ibid*.
[42] By, for example, crosspollination of landrace and wild plant varieties with genetically manipulated plant varieties.
[43] Straub, *supra* note 37.

The governments of developing countries find themselves under pressure from developed world to join international (TRIPS and UPOV) and bilateral (TRIPS-plus) agreements on the protection of intellectual property. These agreements would obligate them to adjust their domestic IP laws and to protect foreign intellectual property according to 'Northern' standards. As a result, developing countries are forced to find ways to strike an adequate balance between intellectual property rights and social rights of their populations.[44]

When farmers in developing countries have to give up cultivating food crops this does not only affect their own subsistence but also the local availability of food in general. The human right most affected by the new developments in agrotechnology and intellectual property legislation is, therefore, the right to adequate food.[45]

To fulfill the right to adequate food recognized as a human right in international human rights instruments, adequate food must be both available and accessible to everybody in sufficient quality and quantity. Availability requires that food is either produced locally on farmable land or is transported from the site of production to the places of demand. As worldwide food production is already high enough to feed every inhabitant of the earth, the true problem is not insufficient production but unequal access thereto. Therefore, measures to make existing food available to the hungry have priority over those aimed at increasing food production.[46]

Where food is available, it must be economically and physically accessible for those who are in need. Economic accessibility requires that a suitable diet be affordable for everyone. Apart from disbalanced food pricing, inappropriate minimum wages and state subsidies are all factors involved to hinder for a life of dignity, the TNCs' longing for income boost provides its significant 'mite' to the conservation of *status quo* and crackdown in international legal toolkit.[47]

---

[44] Straub, Peter (Winter 2006). Farmers in the IP Wrench - How Patents in Gene-Modified Crops Violate the Right to Food in Developing Countries? *Hastings International and Comparative Law Review, 29*, Retrieved September 21, 2007, from http://international.westlaw.com.
[45] *Ibid*.
[46] *Ibid*.
[47] *Ibid*.

3 The analysis of international legal toolkit, its congruity and antilogy

This chapter in its first and second subchapters will provide, respectively, for the description and analysis of the legal documents bearing relation to plant genetic resources, new plant variety protection, and ESCR; and for comparative analysis of the said documents with the aim of distinguishing legal conformities and controversies.

3.1 The toolkit

The global conventions pertaining to protection of plant genetic resources, both generally and in terms of specific standards, are the International Convention for the Protection of New Varieties of Plants (UPOV Convention) adopted in 1961 and revised in 1972, 1978, 1991; the Convention on Biological Diversity (CBD), one of the outcomes of the United Nations Conference on Environment and Development in Rio de Janeiro in 1992; the Trade Related Aspects of Intellectual Property Rights Agreement (TRIPS) signed as part of the Uruguay Round of GATT in April 1994; and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGR), adopted by the FAO Conference through Resolution 3/2001 in November 2001.

The Universal Declaration of Human Rights (UDHR) and International Covenant on Economic, Social and Cultural Rights (ICESCR) will also be considered as documents pertaining to ESCR protection.

In spite of a number of international instruments currently regulating plant genetic resources, instead of a unified and coherent system providing universal set of principles and rules, the current instruments rather reflect a dynamic regime complex inviting different priorities and interests of various international actors.[48]

3.1.1 International Convention for the Protection of New Varieties of Plants

The UPOV Convention was concluded in Paris in 1961[49], then it was revised in Geneva in 1972 and 1978[50], and in 1991 the last revision took

[48] Kennedy, Rónán (Winter 2006). International Conflicts over Plant Genetic Resources: Future Developments? *Tulane Environmental Law Journal, 20*, Retrieved June 23, 2007, from http://international.westlaw.com.

[49] Belgium is the only Party to 1961 Act of the UPOV Convention with a declaration that the 1978 Act applies to the territory of the French Republic, including the Overseas Departments and Territories.

place at a Diplomatic Conference held in Geneva. Upon concluding the revised Act of 1991, the Act of 1978 remained open for accession for developing countries, for the 1978 Act was of a 'better appropriateness' to many developing countries in comparison to the 1991 Act as a basis for national legislation (see Supplement A).

The UPOV Convention obligates Parties thereto to adopt national legislation to give plant varieties legal protection, which means that whoever creates a new plant variety (i.e. the breeder) must be given adequate legal protection from unauthorized exploitation of the new variety.

The adoption of such international legal instrument was invited by the aim to encourage the development of new varieties of plants to contribute to food security and availability (by the increase in quantity, quality and diversity of foodstuffs), sustainable agriculture (for example, by a more efficient use of available resources and inputs or by the use of pest and disease resistant varieties), and protection of biodiversity (for example, by reducing pressure on natural ecosystems through better productivity of cultivated lands, and increase in species diversity).[51]

To be protected under the UPOV system, a plant variety should meet the so-called DUS criteria: distinctiveness, uniformity and stability. The said criteria, however, can be interpreted as discouraging variability among plant varieties. The latter two requirements dispose breeders to develop varieties that have low adaptability, that are suitable for export. Uniformity over large areas leads to vulnerability. Broad variability in plant varieties can often be useful for agricultural purposes, and the said criteria deny protection to breeders of cultivated landraces that demonstrate diversity traits and are adapted to the needs of local farmers. Some scholars fear that UPOV System can reduce plant genetic diversity by rewarding breeders of uniform plant varieties, which in its turn can shift to non-sustainable monoculture systems.[52] Thus, the uniformity provision in the UPOV Convention tends to destroy diversity in the field, rather than safeguard it. Additionally, there is not one provision in the UPOV Convention relating to preservation of genetic resources.[53]

That goes contrary to UPOV stated purposes of protection of biodiversity, sustainable agriculture and food security, which means that

---

[50] The following states are currently Parties to the 1978 Act: Argentina, Bolivia, Brazil, Canada, Chile, China, Colombia, Ecuador, France, Ireland, Italy, Kenya, Mexico, New Zealand, Nicaragua, Norway, Panama, Paraguay, Portugal, Slovakia, South Afrika, Switzerland, Trinidad and Tobago, Uruguay.

[51] Bonadio, Enrico (2007). Crop Breeding and Intellectual Property in the Global Village. *European Intellectual Property Review, 29 (5),* Retrieved September 16, 2007, from http://international.westlaw.com.

[52] Leskien, Dan and Michael Flitner (1997).Intellectual Property Rights and Plant Genetic Resources: Options for a Sui Generis System. *Issues in Genetic Resources. 6.*

[53] Barron, Nadine and Ed Couzens (2004). Intellectual Property Rights and Plant Variety Protection in South Africa: an International Perspective. *Journal of Environmental Law, 16,* Retrieved September 20, 2007, from http://international.westlaw.com.

UPOV System *per se* has contradictions with its stated aims; let alone opinions whether the plant varieties, at least those of food and agriculture, should be protected at all to pursue the very same aims.

Apart from the abovementioned, the 1991 version of the UPOV Convention broadens the rights of breeders (in comparison with the earlier versions of 1961 and 1978). In particular, the 1991 Treaty clearly states that PVP must be applicable to plant varieties that are merely discovered and developed (not only created) by the breeder, and essentially derived from protected varieties. Moreover, the so-called 'farmers' privilege' has also been limited.[54]

The issue of mere discovery is deemed to be of great importance, for it rewards and protects activities merely on the basis of discovering and further developing of already existed varieties. This poses a concern that some PVP offices can interpret this issue as authorization to grant protection without requiring breeders (discoverers) to carry out a 'creative' act. In this case, such an interpretation would be inconsistent with the principles of intellectual property according to which inventors must provide an incentive for creative endeavours. This, in its turn, poses a threat of progressive monopolization of plants which already exist in nature and are known.[55]

Although the IP laws of some countries use the words 'invention' and 'discovery' synonymously, it is a universally accepted principle that discoveries in the strict sense of the word are not entitled to protection. The European Patent Convention (EPC), for example, like the laws of many other countries, goes so far as to explicitly exclude discoveries from patentability. The Guidelines for Examination in the European Patent Office (EPO) highlight the difference between inventions and mere discoveries by way of example: "If a man finds out a new property of a known material or article, that is mere discovery and unpatentable. If, however, a man puts that property to practical use he has made an invention which may be patentable" (Part C, chapter IV, 2.3).[56]

Extension of breeders' ownership rights to essentially derived varieties (another introduction of 1991 Act) is also of importance. Preventing second generation of breeders from developing new plant varieties which are essentially derived from protected ones can stifle research activities in agricultural sector. The ongoing progress in plant breeding is very dependant on the access to existing genetic resources and development thereof.

---

[54] Bonadio, Enrico (2007). Crop Breeding and Intellectual Propery in the Global Village. *European Intellectual Property Review*, *29 (5)*, Retrieved September 16, 2007, from http://international.westlaw.com.

[55] *Ibid*.

[56] Leskien, Dan and Michael Flitner (1997).Intellectual Property Rights and Plant Genetic Resources: Options for a Sui Generis System. *Issues in Genetic Resources. 6*, p. 8.

As for the 'farmer's privilege', the 1991 Act strongly limits it. "The farmers' privilege is the right of farmers who have purchased a seed of a protected variety to save seeds from the resulting harvest for planting in the subsequent season."[57] However, some legislations provide for the rights of farmers to be extended to exchange and sale of certain quantities of seeds for reproductive purposes.[58]

The 1991 version of UPOV Convention, unlike the 1987 Act, does not authorize farmers to exchange or sell seeds for propagation purposes (see Supplement A). This limitation is in conflict with old traditions of farmers in developing countries, for seeds there are regularly exchanged for purposes of seeds rotation which gives a hand to, for instance, plant disease avoidance. Food security of many local communities in developing countries in fact depends on their saving, sharing and planting seeds from the previous harvest.[59]

Many developing nations, particularly those in Africa, have resisted ratifying the 1991 Act or adopting it as the standard for their plant variety protection laws. The foreign ministers of the Organization for African Unity issued a statement at a January 1999 meeting calling for a hold on IPR protection for plant varieties until an Africa-wide system had been developed that grants greater recognition to the cultivation practices of indigenous communities. However, at a subsequent meeting of the *Organisation Africaine de la Propriété Intellectuelle* (OAPIO), patent officials from sixteen francophone African nations recommended that their countries adopt the 1991 Act. As of the date of this report, only one African nation had ratified the 1991 Act – Tunisia, in 31 August 2003. Kenya and South Africa are other two UPOV members, both of whom are parties to the 1978 Act.[60]

3.1.2 Convention on Biological Diversity and Bonn Guidelines

The CBD is an umbrella international instrument which has as its aims both sustainable use of the planet's biological diversity and the fair and equitable distribution of the benefits arising from the use of genetic resources. The CBD does not deal specifically with the issue of plant variety protection but is of direct relevance to the creation of protection regimes for plant varieties

[57] Bonadio, Enrico (2007). Crop Breeding and Intellectual Propery in the Global Village. *European Intellectual Property Review, 29 (5)*, Retrieved September 16, 2007, from http://international.westlaw.com.
[58] *Ibid*.
[59] *Ibid*.
[60] Helfer, Laurence R. (2002). Intellectual Property Rights in Plant Varieties: An Overview with Options for National Governments. *FAO Legal Papers Online*, *32*, Retrieved September 26, 2007, from http://www.fao.org

since its scope comprises all biological resources. Generally, it constitutes the central instrument concerning biodiversity at the international level.[61]

The CBD is a legal framework to promote the adoption of all measures aimed at ensuring: (i) conservation of biodiversity, (ii) sustainable use of its components, and (iii) fair and equitable sharing of benefits arising from the use of genetic resources. Under the CBD, genetic resources are a part of national sovereignty, and thus are not common property.[62] The Convention provides for, in Article 10, the integration of conservation and sustainable use of biological resources into national decision-making, protection of traditional cultural practices that are compatible with conservation or sustainable use. Further, in Article 15, attention is paid to the access to genetic resources for environmentally sound uses. Moreover, the CBD promotes free trade to finance conservation and the transfer of technology having led to efforts promoting the biodiversity conservation.[63]

Although the CBD does not expressly refer to any international IPR agreements, it contains numerous provisions relating to IPRs, principally in Article 16. In particular, Article 16 (5) recognizes that IPRs "may have an influence on the implementation" of the CBD. The article obliges member states to cooperate in order to ensure that IPRs are "supportive of and do not run counter to" the treaty's objectives. Other provisions make clear that the CBD is to be interpreted so as to preserve the rights of IPR owners recognized in international law. For example, Articles 16 (2)-(4) state that the transfer of technology and measures taken to gain access to such technology shall be consistent with the adequate and effective protection of IPRs recognized in international law.[64]

On the back of this, the Conference of the Parties (COP) adopted the so-called Bonn Guidelines on access to genetic resources and the fair and equitable sharing of the benefits arising from their utilization. The Guidelines are created with the aim to provide the Parties and their Governments a hand in implementation of the access to genetic resources and benefit sharing when establishing legislative or other measures on access and benefit sharing.[65]

---

[61] Barron, Nadine and Ed Couzens (2004). Intellectual Property Rights and Plant Variety Protection in South Africa: an International Perspective. *Journal of Environmental Law, 16*, Retrieved September 20, 2007, from http://international.westlaw.com.

[62] Article 15 of CBD has it: "Recognizing the sovereign rights of States over their natural resources, the authority to determine access to genetic resources rests with the national governments and is subject to national legislation".

[63] Kennedy, Rónán (Winter 2006). International Conflicts over Plant Genetic Resources: Future Developments? *Tulane Environmental Law Journal, 20*, Retrieved June 23, 2007, from http://international.westlaw.com.

[64] Helfer, Laurence R. (2002). Intellectual Property Rights in Plant Varieties: An Overview with Options for National Governments. *FAO Legal Papers Online, 32*, Retrieved September 26, 2007, from http://www.fao.org.

[65] Access to Genetic Resources and Benefit-sharing. Bonn Guidelines. Retrieved September 13, 2007, from Convention on Biological Diversity Web site: http://www.cbd.int/programmes/socio-eco/benefit/bonn.asp#.

Developing countries, on agreeing to the Convention, were expecting benefits from bioprospecting through transforming genetic resources into domain of national sovereignty, for the CBD represented some important gains for the developing world recognizing the national sovereignty principle and obliging corporations to use developing countries' seed germplasm to pay royalties and transfer technology to the host countries.[66] Their hopes have yet to be materialized. This shortcoming deems to be stipulated by the bureaucratic impediments and unwillingness and reluctance of the Parties to commit to risky benefit sharing arrangements.[67]

Prior to the CBD, genetic resources were considered to be a part of the common heritage of mankind (CHM) and treated as commons. Importantly, placing genetic resources in the CHM has a symbolic meaning; it denotes the importance of these resources for all humanity. In some cases, however, CHM is incompatible with the exercise of state sovereignty, especially when the resources are found within the territory of a country. It differs from classic global commons – resources that are not clearly circumscribed by national borders, such as the high seas and airspace. Hence, the CHM should not necessarily imply that such resources are accessible to and usable by anyone without restrictions. However, in practice, genetic resources ranked in the CHM are treated as commons, resulting in overuse and extinction. [68]

3.1.3 Trade Related Aspects of Intellectual Property Rights Agreement

This Agreement is an overall agreement of the World Trade Organization (WTO) covering all issues of IP and establishing uniform international standards for the protection of IP.[69]

In the Patents section of the Agreement, it is provided in Article 27.1 that patents be available in all fields of technology based on the criteria of novelty, industrial applicability and involving an inventive step. No further guidelines as to the understanding of the notions of 'novelty' have been provided, which makes it questionable for the application to plant variety patents. Article 27.2 contains a serious restriction to the general principle of eligibility to be patented: a WTO member may exclude inventions from patentability based on a risk that their commercial exploitation within its territory could endanger the *ordre public* or morality within the territory of

[66] Aoki, Keith (March, 2007). Distributive and Syncretics Motives in Intellectual Property Law (with Special Reference to Coercion, Agency, and Development). *U.C. Davis Law Review, 40*, Retrieved September 20, 2007, from http://international.westlaw.com.
[67] Kennedy, Rónán (Winter 2006). International Conflicts over Plant Genetic Resources: Future Developments? *Tulane Environmental Law Journal, 20*, Retrieved June 23, 2007, from http://international.westlaw.com.
[68] Smagadi, Aphrodite (2006). Analysis of the Objectives of the Convention on Biological Diversity: Their Interrelation and Implementation Guidance for Access and Benefit Sharing. *Columbia Journal of Environmental Law*, Retrieved March 13, 2007, from http://international.westlaw.com.
[69] Kennedy, *supra* note 67.

the WTO member concerned. Examples given are the protection of human, animal or plant life or health. Avoiding serious prejudice to the environment is also a ground for exclusion from patentability.[70] However, the very article reserves that "… such exclusion is not made merely because the exploitation is prohibited by their law". States may also exclude plants and animals from intellectual property rights protection, but not plant varieties:

TRIPS Article 27.3(b) reads:

> Members may also exclude from patentability: 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 generis* system...

Because of this provision, plant varieties falls firmly under the legal regime of TRIPS. Plant varieties must now be patentable or be open to an 'effective *sui generis* system' of intellectual property rights. The precise meaning of 'effective *sui generis* system' is unknown. Most people conclude that plant variety patents, a kind of patent system for agriculture, would satisfy this requirement. However, plant variety patents have proven to be a legal incentive to breed uniformity and restrict the rights of farmers and local communities.

The mention of a *sui generis* system was probably a reference to UPOV Convention, and has led to some developing countries signing up to UPOV, which allows members to draft supplementary unilateral treaties within the UPOV framework.[71] However, the very possibility of protecting plant varieties through *sui generis* system invites a perspective of reconciliation which will be discussed below.

Unlike all prior intellectual property treaties, TRIPS is not a free-standing agreement concerned solely with IPRs. TRIPS is linked to a larger family of trade-related treaties concerning subjects such as trade in goods and services, agriculture, textiles and health-related restrictions on imports. All of these treaties were adopted within the WTO during the Uruguay Round of trade negotiations held between 1988 and 1994.[72] The developing countries most likely accepted TRIPS, despite their misgivings about IPRs, for two reasons. First, TRIPS is a part of a packaged whole, and the benefits of the other GATT agreements are weighty in comparison. On the other hand, they may have been motivated by the improved access to markets in developed countries, wanting to avoid trade barriers that might result if they

[70] Gervais, Daniel J. (1999). The TRIPS Agreement: Interpretation and Implementation. *European Intellectual Property Review*, *21 (3)*, Retrieved September 13, 2007, from http://international.westlaw.com.

[71] Kennedy, Rónán (Winter 2006). International Conflicts over Plant Genetic Resources: Future Developments? *Tulane Environmental Law Journal*, *20*, Retrieved June 23, 2007, from http://international.westlaw.com.

[72] Helfer, Laurence R. (2002). Intellectual Property Rights in Plant Varieties: An Overview with Options for National Governments. *FAO Legal Papers Online*, *32*, Retrieved September 26, 2007, from http://www.fao.org.

stayed out of the new system.[73] "In short, TRIPS was a loss but the WTO package of agreements was a net gain."[74]

In this context, and taking into consideration the fact that a high level of IP protection is not in accordance with the developing countries' interests, the implementation of TRIPS is taking a low and costly pace.[75] The pressure from developed countries to sign bilateral 'TRIPS-plus' agreements to heighten the level of IP protection created even greater animosity to TRIPS on the part of developing world.[76] Some developing countries want to amend TRIPS while questioning the allegation that a high level of IP protection actually facilitates the transfer of technologies from developed to developing countries.[77] Despite the objections of developed countries, some developing countries are insisting on TRIPS Council discussions over the relationship between TRIPS and other authorities in the field.[78]

The patent system also appears highly inequitable by giving patent protection primarily to the biotechnology companies. Debates on genetic resources and intellectual property have escalated since the signing of TRIPS. Developing countries and NGOs argue that rigid intellectual property rights over plant genetic resources are a major obstacle to adequate balance of IPRs and HRs because of the increase of large TNCs' access to developing countries' easily-accessible and vulnerable free or cheap resources.[79]

3.1.4 International Treaty on Plant Genetic Resources for Food and Agriculture

This Treaty is the most recent international agreement addressing plant genetic resources that has emerged out of forum-shifting led by Mexico and supported by NGOs and activists having had chosen FAO as a new forum for the new agreement.[80]

---

[73] Kennedy, Rónán (Winter 2006). International Conflicts over Plant Genetic Resources: Future Developments? *Tulane Environmental Law Journal*, *20*, Retrieved June 23, 2007, from http://international.westlaw.com.
[74] Dutfield, Graham (2002). Trade, Intellectual Property and Biogenetic Resources: A Guide to the International Regulatory Landscape. Retrieved September 13, 2007, from International Centre for Trade and Sustainable Development (ICTSD) Web site: http://www.ictsd.org/dlogue/2002-04-19/Dutfield.pdf.
[75] Kennedy, *supra* note 73.
[76] *Ibid*.
[77] *Ibid*.
[78] *Ibid*.
[79] Smagadi, Aphrodite (2006). Analysis of the Objectives of the Convention on Biological Diversity: Their Interrelation and Implementation Guidance for Access and Benefit Sharing. *Columbia Journal of Environmental Law*, Retrieved March 13, 2007, from http://international.westlaw.com.
[80] Helfer, Laurence R. (Winter 2004). Regime Shifting: The TRIPS Agreement and New Dynamics of International Intellectual Property Lawmaking. *Yale Journal of International Law*, *29*, Retrieved September 13, 2007, from http://international.westlaw.com.

One of the main concerns motivated for the adoption of a legal instrument governing plant genetic resources was the concern of developing countries over the security of native plant varieties, particularly seeds. As the holders of the majority of *in situ* crop collections, developing countries were concerned that developed countries' plant breeders were securing IPRs for their own varieties[81]. In 1981 a resolution recommending the draft of a binding legal instrument was approved but by 1983 this initiative was reduced to a call for a nonbinding undertaking – the International Undertaking on Plant Genetic Resources (IUPGR). IUPGR was agreed by over 100 countries including many developed nations.[82]

Later on, in 1992 the need for harmonization of IUPGR with the CBD arose. On the back of this, the Nairobi Conference for the Adoption of the Agreed Text of the Convention on Biological Diversity adopted a resolution recognizing the said need, particularly regarding the question of farmers' rights[83]. In 1993 the Commission on Plant Genetic Resources (CPGR) recommended that the Undertaking be revised in light of the CBD. Seven long years of intricate and often tedious negotiations ended up in producing more than a revised Undertaking; they produced a binding treaty, the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGR), implemented in November 2001.[84]

The ITPGR activated the reversal mechanism of privatization by creating a special collective property right for a limited number of staple food and feed crops, for the unaffordable costs of segregating seeds and tracing samples for essential crops were a serious impediment for those working for the poor. Therefore, a certain part of most important PGRs were in actual fact placed back to the public domain.[85]

Perhaps the main achievement of the ITPGR is the creation of Multilateral System of Access and Benefit-Sharing (MS). This System purports access to certain material consisting of a carefully negotiated list of thirty-five crops and thirty-two forages. Although some developed countries wanted MS to include all existing PGRs, which was resisted by the developing world with a saving to further open access provided the MS proves to be efficient in benefit sharing. The access is available on condition that "[r]ecipients shall not claim any intellectual property or other rights that limit the facilitated access to the plant genetic resources for food and agriculture, or their genetic parts or components, in the form received from

[81] Kennedy, Rónán (Winter 2006). International Conflicts over Plant Genetic Resources: Future Developments? *Tulane Environmental Law Journal*, *20*, Retrieved June 23, 2007, from http://international.westlaw.com.
[82] *Ibid*.
[83] *Ibid*.
[84] *Ibid*.
[85] *Ibid*.

the Multilateral System"[86], and is a subject to the acceptance of a Material Transfer Agreement.[87]

While all Parties to the Treaty agreed upon interdiction to patent genetic materials in the form received under the MS, disaccord existed among them as to whether and when DNA sequences could be patented.[88] There are two categories of genetic material to consider: 'parts and components' (patenting of raw DNA sequences simply extracted from PGRs) and 'derivatives' (where extracted DNA is combined with other DNA to create a new plant). The first category does not suffice to the mere criteria of patentability and is excluded by the very language of ITPGR; still some developed countries would interpret it as allowing certain patents.[89] The second category is unclear, and thus requires further interpretation of the Governing Body to avoid misuse and misinterpretation by some Parties to the Treaty.

Part III, Article 9.1 of the Treaty notes that "[t]he Contracting Parties recognize the enormous contribution that the local and indigenous communities and farmers of all regions of the world ... have made and will continue to make for the conservation and development of plant genetic resources which constitute the basis of food and agriculture production throughout the world". Within that particular clause is the basis for farmers' rights.[90]

3.1.5 The Universal Declaration of Human Rights and International Covenant on Economic, Social and Cultural Rights

The UDHR is an advisory declaration adopted by the United Nations General Assembly (A/RES/217) on 10 December 1948 in Paris outlining the view of the United Nations General Assembly on the human rights guaranteed to all people. Later, on 16 December 1966 a second generation human rights treaty was introduced developing some of the social issues contained in the UDHR – the International Covenant on Economic, Social and Cultural Rights (ICESCR).

If asked to identify the freedoms and liberties protected by human rights of inventors to protect the fruits of their intellectual efforts, and on the other hand human rights affected by the rights of investors, one can name

---

[86] International Treaty on Plant Genetic Resources for Food and Agriculture; Article 12.3(d).
[87] Kennedy, Rónán (Winter 2006). International Conflicts over Plant Genetic Resources: Future Developments? *Tulane Environmental Law Journal, 20*, Retrieved June 23, 2007, from http://international.westlaw.com.
[88] *Ibid*.
[89] *Ibid*.
[90] Ruby, Steven M. (2004). The International Treaty on Plant Genetic Resources for Food and Agriculture: Friend of the International Farmer. *Oklahoma Journal of Law & Technology, 2*, Retrieved October 1, 2007, from http://international.westlaw.com.

two. Respectively, the first is the right of everyone "to the protection of the moral and material interests resulting from any scientific … production of which he is the author" vested by Article 27.2 of the UDHR and later supported by nearly identical language in Article 15.1 (c) of the ICESCR, thus granting some intellectual property rights the notion of a human rights and providing it with a higher protection. The second is the right threatened by the intellectual property rights, as they are tending to be today in developing countries – "… the right of everyone to an adequate standard of living …, including adequate food …" vested by the Article 11.1 of the ICESCR and in nearly identical language by the Article 25.1 of the UDHR as well as "the fundamental right … to be free from hunger", Article 11.2 of the ICESCR. These latter rights are hardly coming into agreement with the breeders' rights as provided for by the UPOV Convention, especially the 1991 Act version. This fact, in its turn, invites imbalance between two legal regimes of human rights and intellectual property rights.

The ICESCR, the principal international treaty that protects ESCR, is a programmatic treaty. Its provisions are written in an ambiguous language requiring each State party to "take steps . . . to the maximum of its available resources, with a view to achieving progressively the full realization of the rights recognized in the present Covenant by all appropriate means"[91] [92].

Only in last decade have the ESCR received standing jurisprudential attention, to a large extent due to the promotion and amplification of ESCR by the Committee on ESCR by the means of, for instance, providing States parties with nonbinding 'general comments' (GC), recommended interpretations, on specific article of ICESCR or a specific human rights issue.[93]

In the autumn of 2001 the Committee on ESCR issued its first observations on intellectual property issues – "Statement on Human Rights and Intellectual Property". The Statement provided for the analysis of intellectual property issues contained in the Covenant and their relations with regard to other human rights embodied in the ICESCR. It also set out for the Committee to draft GCs on every intellectual property clause of ICESCR. On 21 November 2005, the Committee adopted the first of these GCs – GC No. 17 (Article 15.1(c)).

The Committee in the GC No. 17 provides for interpretation of normative content of Article 15.1(c) and delimits the notion of 'authorship' to the needs of human rights regime:

> The committee considers that only the 'author', namely the creator, whether man or woman … of scientific … productions … can be the beneficiary of the protection of article 15, paragraph 1(c). This follows from the words

[91] International Covenant on Economic, Social and Cultural Rights; Article 2.1.
[92] Helfer, Laurence R. (March, 2007). Toward a Human Rights Framework for Intellectual Property. *U.C. Davis Law Review*, *40*, Retrieved September 17, 2007, from http://international.westlaw.com.
[93] *Ibid*.

> 'everyone', 'he' and 'author', which indicate that the drafters of that article seemed to have believed authors of scientific … productions to be natural persons, …

The Committee specifically draws attention to the inclusion of legal entities among the holders of intellectual property rights under the existing international treaty protection regimes, and states that, "because of their different nature [they] are not protected at the level of human rights".

Further in the GC the Committee places emphasis on impossibility of considering the rights of authors to benefit from their work in isolation from the other rights recognized in the Covenant. That imposes the obligation on States parties "to strike an adequate balance between their obligations under Article 15.1(c)" and other rights guaranteed in the Covenant. The Committee as well specifies that "the private interests of creators should not be unduly advantaged and the public interest in enjoying broad access to their [creators'] productions should be given due consideration".

> States parties should therefore ensure that their legal or other regimes for the protection of … interests resulting from one's scientific … productions constitute no impediment to their ability to comply with their core obligations in relation to the rights to food, health, …States parties thus have a duty to prevent that unreasonably high costs for access to essential medicines, plant seeds or other means of food production, … undermine rights of large segments of the population to health, food and education.

Article 11.2 of the ICESCR provides that States parties shall take measures to ensure the fundamental right to be free from hunger. These measures, as the Article reads are needed "to improve methods of production, conservation and distribution of food …"

Although this statement can be regarded as an innocent reminder for States Parties to avoid derogating from one set of treaty rules while satisfying another, the reference to compliance with the Covenant's 'core obligations' alludes to deeper structural understanding of how the governments can and should reconcile human rights and intellectual property.[94] However, inasmuch as GCs are only providing with nonbinding interpretations of the rights vested in ICESCR, governments can interpret these recommendations as nothing more but inspirational goals.

Although it falls out of the scope of the given work, it is worth mentioning here that concern of human rights with regard to plant genetic resources does not confine itself to plants for food and agriculture only, but also includes plants used in pharmacologic industry and medicine.

[94] Helfer, Laurence R. (March, 2007). Toward a Human Rights Framework for Intellectual Property. *U.C. Davis Law Review, 40*, Retrieved September 17, 2007, from http://international.westlaw.com

3.2 The congruity and antilogy

The comparative analysis following further is providing for apparent layout of polarization of the legal instruments into two major groupings, stipulated by the North-South confrontation over PGRs.

3.2.1 The congruity

The following is the discernment of common approaches and views as well as mutual support of authorities governing PGRs in international level.

3.2.1.1 CBD and ITPGR

In 1994 the FAO initiated an intergovernmental round of negotiations meant to revise the 1983 IUPGR in order to make it legally binding and harmonize with provisions of 1992 CBD that were at odds with the 1983 IUPGR's definition of 'common heritage', i.e. IUPGR placed PGRs into public domain.[95] The CBD differed in this key with IUPGR acknowledging the notion that countries of origin of biological resources exercised sovereignty over plants, animals, and microorganisms within their national boundaries, i.e. the CBD did not take a 'common heritage' approach to biological resources.[96]

The ITPGR also places certain PGRs into public domain;[97] however the preamble and the Article 10 of the ITPGR reaffirm that that rights over PGRs are sovereign and make reference in the preamble to the IUPGR's 'heritage of mankind', which has become a 'common concern of all countries'. Thus, this modification extinguishes the conflict for now. The FAO Conference through Resolution 3/2001 adopting the ITPGR emphasized that ITPGR is in harmony with the CBD that makes it possible to name the two conventions favourers for each other's goals.

3.2.1.2 TRIPS Agreement and UPOV Convention

When TRIPS was negotiated, participants agreed to revisit article 27.3(b) four years after the date of entry into force. In December 1998, the TRIPS Council met to discuss procedures for the upcoming review, but fought over whether members were charged with reviewing implementation or actual provisions. The United States was eager to confine discussions to implementation only, whereas India and the Association of Southeast Asian Nations stressed that the mandate expressly covered provisions. Ultimately, TRIPS Council members agreed that they were required to discuss

---

[95] Aoki, Keith (March, 2007). Distributive and Syncretics Motives in Intellectual Property Law (with Special Reference to Coercion, Agency, and Development). *U.C. Davis Law Review*, *40*, Retrieved September 20, 2007, from http://international.westlaw.com.
[96] Aoki, Keith (2004). Malthus, Mendel, and Monsanto: Intellectual Property and the Law and Politics of Global Food Supply: an Introduction. *Journal of Environmental Law and Litigation*, *19*, Retrieved September 20, 2007, from http://international.westlaw.com.
[97] Kennedy, Rónán (Winter 2006). International Conflicts over Plant Genetic Resources: Future Developments? *Tulane Environmental Law Journal*, *20*, Retrieved June 23, 2007, from http://international.westlaw.com.

substantive provisions. The US agenda included the deletion of exclusions to patents on life forms and the incorporation of the 1991 Act revision of the UPOV Convention into TRIPS. Developing countries were prepared to resist the incorporation of UPOV Act 1991 into TRIPS as the *sui generis* alternative, request extensions for implementation, and insist upon the primacy of CBD over TRIPS in cases of conflict.[98] After extensive debates over the issue of UPOV Act 1991 incorporation into TRIPS, it was decided to lift this incentive.

Recall that Article 27.3(b) of TRIPS allows members to "... provide for the protection of plant varieties either by patents or by an effective *sui generis* system or by any combination thereof". TRIPS neither defines what amounts to an effective *sui generis* system nor does mandatory require its development on any standardized lines.[99] TRIPS provisions on plant varieties do not refer to or incorporate any preexisting intellectual property agreements, including the 1978 and 1991 UPOV Acts. This omission contrasts sharply with other fields of intellectual property, such as patents, copyrights and trademarks, for which TRIPS explicitly requires its members to comply with the standards of protection contained in preexisting IP agreements, such as the Berne Convention for the Protection of Literary and Artistic Works and the Paris Convention for the Protection of Industrial Property. As a result of this omission, TRIPS members are neither required to become members of UPOV nor to adjust national laws consistent with either UPOV Act in order to comply with their obligations under TRIPS.[100]

The discretion enjoyed by states to shape their plant variety protection laws to balance the protection of IPRs against other societal concerns is dependent upon the international agreement or agreements to which they are parties,[101] thus patterning domestic legislation after the UPOV Convention can take place if a State is already a Party to any of the UPOV Acts; this can make the State follow its respective obligations under one of the UPOV Acts, disregarding whether a State is a Party to TRIPS or not. No indication or obligations to follow the very UPOV regime in providing protection by *sui generis* system is present in TRIPS. However, it would seem densely bizarre, from legal perspective, if a country established a *sui generis* system of plant variety protection (other than UPOV) at the same time being a Party to UPOV Convention.

---

[98] Sell, Susan K. (Spring, 2002). Post-TRIPS Developments: the Tension between Commercial and Social Agendas in the Context of Intellectual Property. *Florida Journal of International Law, 14*, Retrieved September 20, 2007, from http://international.westlaw.com.

[99] Nwabueze, Remigius N. (Summer 2003). Ethnopharmacology, Patents and the Politics of Plants' Genetic Resources. *Cardozo Journal of International and Comparative Law, 11*, Retrieved September 20, 2007, from http://international.westlaw.com.

[100] Helfer, Laurence R. (2002). Intellectual Property Rights in Plant Varieties: An Overview with Options for National Governments. *FAO Legal Papers Online, 32*, Retrieved September 26, 2007, from http://www.fao.org.

[101] *Ibid.*

Thus, States Parties to TRIPS that are free from UPOV Convention obligations can facilitate their situation with an effective and balanced *sui generis* system or its mixture with patents that would meet human rights concerns. Hence, it is not the TRIPS that poses the impediments for human rights enjoyment but the 'detonating mixture' of TRIPS and UPOV, especially the 1991 Act.

Moreover, going back to the issue of mere discovery, although in most industrialized countries there is a clear, though not uniform, trend towards recognizing isolated or purified products of nature as protectable subject matter if their existence was previously unknown, the TRIPS Agreement does not oblige WTO States Parties to follow this trend. TRIPS gives no indication that by their first isolation, naturally occurring gene sequences and other parts of plants have to be regarded as protectable inventions. Nor does it include any provisions on where the line between inventions and discoveries is to be drawn. Clearly, member states remain free to refuse protection for plant genetic material which has merely been discovered or where its use was already known.[102]

3.2.2 The antilogy

The discrepancy of current international legislation on PGRs is examined below.

3.2.2.1 CBD versus TRIPS

Though intellectual property rights are important under both TRIPS and CBD, their approaches thereto strikingly differ in perspectives and thus are in direct conflict with each other. The CBD recognizes sovereign rights of states over their genetic resources, which contradicts privatization thereof. Under the TRIPS, however, these resources, once genetically modified, fall into the property of the party undertaken the work.[103]

National sovereignty implies that countries can rule out the IPRs on biological resources. TRIPS, however, overlooks these rights by requiring the provisions of IPRs on microorganisms, non-biological and microbiological processes, and plant varieties. Clearly, the issue of patent protection for modified life forms raises a number of questions about ownership and control of genetic resources. Complex organisms, which have evolved over millennia in nature, and through the contributions of indigenous peoples, are reduced to their parts. Patenting of genes thus leads to a devaluation of life forms by reducing them to their constituents and allowing them to be owned as private property. This reductionism might be

[102] Leskien, Dan and Michael Flitner (1997).Intellectual Property Rights and Plant Genetic Resources: Options for a Sui Generis System. *Issues in Genetic Resources. 6*, p. 9.
[103] Barron, Nadine and Ed Couzens (2004). Intellectual Property Rights and Plant Variety Protection in South Africa: an International Perspective. *Journal of Environmental Law, 16*, Retrieved September 20, 2007, from http://international.westlaw.com.

convenient for commercial concerns, but it violates the rights of sovereign nations,[104] let alone biodiversity and its sustainability.

The WTO imposes IPRs modeled for the protection of industrial innovations to grant individual monopolies on living things and rejects the existence of community collective innovations. Contrary to the so-called free trade and trade liberalization principles of the WTO, TRIPS is being used as a protectionist instrument to promote corporate monopolies over technologies, seeds, genes and medicines. Through TRIPS, large corporations use intellectual property rights to protect their markets, and to prevent competition.[105] High levels of intellectual property protection imposed by TRIPS have shifted the balance away from the public interest, towards the monopolistic privileges of IPR holders. Historically, countries have taken great care with their national intellectual property rights systems in order to protect the balance between private incentives and the public interest. The possibility of doing so is now challenged to service the imperative of the TRIPS Agreement.[106] This undermines sustainable development objectives, including eradicating poverty, meeting public health needs, conserving biodiversity, protecting the environment and the realization of ESCR.[107]

The argument used by TRIPS proponents and the pharmaceutical industries that patent other kinds of protection are essential to ensure research and development. Presently, there is scant evidence to demonstrate that TRIPS-compliant standards of IPRs will ensure investment in research and development. For example, in pharmaceutical industry of the 1223 new chemical entities developed in the 21-year period between 1975 and 1996, only 11 were for the treatment of tropical diseases.[108] The last major tuberculosis drug was developed 30 years ago, yet tuberculosis remains a major cause of death in many developing countries. There is concern that research and development in the pharmaceutical sector is concentrated on products intended for the lucrative developed country markets. Hence, the increased investments for research and development on drugs for impotence, obesity and baldness, instead of on new and more effective drugs for life threatening or poverty-related 'third world diseases', including malaria and

[104] Barron, Nadine and Ed Couzens (2004). Intellectual Property Rights and Plant Variety Protection in South Africa: an International Perspective. *Journal of Environmental Law, 16*, Retrieved September 20, 2007, from http://international.westlaw.com.
[105] According to WIPO, citizens and corporations of industrialised countries hold 95 percents of the patents in Africa, almost 85 percents of those in Latin America and 70 percents of those in Asia. WIPO, data set IP/STAT/1994/B, released November 1996.
[106] GAIA/GRAIN, (April 1998). TRIPS versus CBD: Conflicts between the WTO regime of intellectual property rights and sustainable biodiversity management. Retrieved September 21, 2007, from GRAIN Web site: http://www.grain.org/briefings/?id=24.
[107] Barron and Couzens, *supra* note 104.
[108] TWN, (June 2001). TRIPS, Patents and Access to Medicines: Proposals for Clarification and Reform (Briefing Paper). Retrieved September 21, 2007, from Third World Network Web site: http://www.twnside.org.sg/title/drugs2.htm.

tuberculosis.[109] The rare studies conducted in countries where plant variety protection has been in effect for decades, such as the United States, show that this kind of legal system has resulted in: little impact in terms of stimulating plant breeding; reduced information and germplasm flows from the private to the public sector; a decreased role for public plant breeding; and increased seed prices for farmers. Despite this, developing countries are being compelled to adopt PVP – not on the basis of its merits for agriculture, but on the basis of it appearing to satisfy the criteria of TRIPS.[110]

The pharmaceutical industry and the US Government want the exclusion enumerated in Article 27.3(b) to be deleted; thus, forcing the world to accept patents on plants and animals, while the developing countries of the South want the Article to remain in place or even be extended. The problems created by Article 27.3(b) are numerous. It sets no parameters for what a *sui generis* system might amount to. It does not lay down any guidelines as to what is 'effective'. With its lack of any benefit sharing mechanism, it offers no remedy to combat biopiracy and is perceived as exacerbating the problem. If it is agreed that IPRs increase commercial benefit, then agreement needs to be reached on the equitable sharing of such benefits. The TRIPS does not provide an answer. The CBD, on the other hand, does seek to provide such an answer.[111]

There is a bias ingrained in TRIPS to protect breeders and biotechnologists at the expense of farmers and local communities. Unlike the CBD, TRIPS does not require applicants to consult with local communities or governments concerning patenting compound forms of a natural plant species from the country of origin. Patents on seeds and genetic resources for food and agriculture threaten sustainable farming practices, farmers' livelihoods and in the long run food security. Farmers using patented or protected seeds are deprived of their right to use, save, plant and sell their seeds. The imposition of patent or any other rigid kind of IP rights over biological resources and traditional knowledge unfairly deprive communities of their rights over, and access to the same resources they have nurtured and conserved over generations. Effectively, centuries of innovation are totally devalued to give monopoly rights on biological resources to those who manipulate genes with new technologies, placing their contributions over and above the intellectual contribution of generations of indigenous farmers and balance of rights in society. This contradicts the key principles and provisions of the CBD. The race to patent genes, cells, and DNA sequences has blurred the crucial distinction between discoveries and basic scientific information, which should be freely

[109] Barron, Nadine and Ed Couzens (2004). Intellectual Property Rights and Plant Variety Protection in South Africa: an International Perspective. *Journal of Environmental Law, 16*, Retrieved September 20, 2007, from http://international.westlaw.com.
[110] GAIA/GRAIN, (April 1998). TRIPS versus CBD: Conflicts between the WTO regime of intellectual property rights and sustainable biodiversity management. Retrieved September 21, 2007, from GRAIN Web site: http://www.grain.org/briefings/?id=24.
[111] Barron and Couzens, *supra* note 109.

exchanged, and truly invented products or processes meriting patent protection.[112]

A number of States Parties to both TRIPS and the CBD are yet ambivalent regarding which should take priority in the event of conflict between these two agreements – agreeing to the demands of corporations or conserving the world's biodiversity and ensuring human rights. The Singapore Ministerial Declaration that was agreed and proclaimed at the WTO's first Conference states that "each member should carefully review all its existing or proposed legislation, programs and measures to ensure their full compatibility with the WTO obligations". This implies that where measures to ensure effective implementation of the CBD are found by the WTO to conflict with States' obligations to promote effective and adequate IPRs in terms of TRIPS, then such measures would have to be abandoned by the relevant States. The above Declaration needs to be considered in light of the relevant CBD provision which requires States to cooperate, "subject to national legislation and international law in order to ensure that such rights are supportive of and do not run counter to its objectives".[113]

The Singapore Ministerial Declaration is an indication that the international community of States gives priority to the WTO as the main forum for consideration of all trade-related issues including IPRs. This can be considered a dangerous development as it subordinates societal concerns to the interests of multinational corporations whose main motivation is profit.[114] Yet, governments, scientists and many social sectors accept that our survival depends on the conservation and free availability of biodiversity and, hence, food, not on its privatization.[115]

Finally, it should be noted that under the Vienna Convention on the Law of Treaties (VCLT), the agreement that is either later in time or clearer and more specific on the issue will prevail. In the case of the TRIPS Agreement and the CBD, both factors would result in the TRIPS Agreement prevailing.[116] However, in a situation where there is a potential conflict, the VCLT calls for the interpretation of the two treaties so as to give effect to both.

3.2.2.2 ITPGR versus TRIPS

The Article 13.2(d/3) of the ITPGR requires its Parties exploiting PGRs commercially to pay "an equitable share of the benefits" into a trust account.

---

[112] Barron, Nadine and Ed Couzens (2004). Intellectual Property Rights and Plant Variety Protection in South Africa: an International Perspective. *Journal of Environmental Law, 16*, Retrieved September 20, 2007, from http://international.westlaw.com.

[113] *Ibid*.

[114] Dutfield, Graham (2000). The WTO, TRIPS and the Biodiversity Convention. Retrieved March 12, 2007, from International Institute for Sustainable Development Web site: http://www.users.ox.ac.uk/~wgtrr/cte4.htm.

[115] GAIA/GRAIN, (April 1998). TRIPS versus CBD: Conflicts between the WTO regime of intellectual property rights and sustainable biodiversity management. Retrieved September 21, 2007, from GRAIN Web site: http://www.grain.org/briefings/?id=24.

[116] Barron and Couzens, *supra* note 112.

This requirement may violate TRIPS by placing an obligation on holders of IPRs in PGRs over and above what is required of other patent holders, which is not permitted under article 27.1 of TRIPS[117] that reads "… patents shall be available and patent rights enjoyable without discrimination as to the place of invention, the field of technology and whether products are imported or locally produced".

At the same time, recalling the VCLT provisions that a treaty either later in time or clearer and more specific on the issue will prevail, the ITPGR is outperforming TRIPS in both factors, which makes ITPGR mandatory for countries that are parties to both treaties.

Thus, the CBD having lost the superiority over the TRIPS according to the VCLT regulations, gains an opening to further its goals by the means of the relevant provisions of the ITPGR mirroring those of the CBD.

3.2.2.3 ICESCR versus TRIPS

On 17 August 2000 the United Nations Sub-Commission on the Protection and Promotion of Human Rights adopted Resolution 2000/7 on 'Intellectual Property Rights and Human Rights'. This resolution signified the Sub-Commission's belief that international IP regimes were not adequately accounting for human rights norms, *i.e.* the norms of the ICESCR and relative provisions of UDHR. Resolution 2000/7 called on UN Member States, intergovernmental bodies, and various UN entities to reaffirm their commitments toward the achievement of international human rights norms, adopt a human rights approach to the development of international intellectual property regimes, and further study the interaction between intellectual property protection and human rights.[118]

The resolution made the following requests: (1) that governments give principal consideration to human rights objectives when crafting national policy and legislation pertaining to intellectual property; (2) that intergovernmental organizations provide similar integration of human rights principles into their policies and practices; (3) that the WTO in particular take human rights obligations into account when reviewing the TRIPS Agreement; and (4) that various UN bodies (including the High Commissioner for Human Rights (HCHR), the Committee on ESCR, and the Secretary-General) assume further measures to analyze the human rights impacts of the TRIPS Agreement.[119]

Pursuant to the Sub-Commission's request, the HCHR submitted a report on the impact of TRIPS on human rights. The HCHR determined that

---

[117] Kennedy, Rónán (Winter 2006). International Conflicts over Plant Genetic Resources: Future Developments? *Tulane Environmental Law Journal, 20*, Retrieved June 23, 2007, from http://international.westlaw.com.

[118] Weissbrodt, David and Kell Schoff (2003). Human Rights Approach to Intellectual Property Protection: the Genesis and Application of Sub-Commission Resolution 2000/7. *Minnesota Intellectual Property Review, 5*, Retrieved September 24, 2007, from http://international.westlaw.com.

[119] *Ibid.*

as currently implemented, TRIPS was not fully compatible with human rights objectives. First, the HCHR noted that "the overall thrust of the TRIPS Agreement is the promotion of innovation through the provision of commercial incentives. The various links with the subject matter of human rights . . . are generally expressed in terms of exceptions to the rule rather than the guiding principles themselves". Second, TRIPS clearly details intellectual property rights, but refers only to general responsibilities of intellectual property holders. The HCHR indicated that, for States Parties to both TRIPS and ICESCR, the balance of interests identified in TRIPS Article 7 might not be sufficient to meet its human rights obligations under ICESCR. Third, the HCHR noted that the TRIPS-imposed obligation "to provide protection for all forms of technology has an impact on States' ability to decide on development strategies". These limitations originate from related policies in developed countries and do not necessarily correspond to the objectives of developing nations. In addition, some developing nations lack the requisite infrastructure to implement the developed nation policies mandated by TRIPS.[120]

Three months after the adoption of Sub-Commission Resolution 2000/7, the Committee on ESCR held a day of discussion in November 2000 to consider whether TRIPS potentially conflicts with human rights norms in the ICESCR. The discussion relied heavily on a discussion paper prepared by Audrey Chapman, a representative of the American Association for the Advancement of Science.[121]

Chapman's presentation to the Committee on ESCR stated that the creation of the WTO and TRIPS had strengthened the world intellectual property regime in a way that was inconsistent with human rights norms. She further stated that the international intellectual property regime had "demonstrated detrimental effects to the rights enshrined in [ICESCR]". She specifically noted that the current intellectual property regime did not apply to indigenous creations and knowledge, negatively affected the right to health by reducing the availability of pharmaceuticals, and threatened the right to food by extending broad plant patent protection to a few agricultural companies that hold patents on the genomes of important global crops.[122] The ESCR Committee concluded the discussion by adoption of GC No. 17 discussed above (in 3.1.5).

As compared with the robust sanctions-based enforcement mechanism of TRIPS within the WTO[123], ICESCR has modest implementation

---

[120] Weissbrodt, David and Kell Schoff (2003). Human Rights Approach to Intellectual Property Protection: the Genesis and Application of Sub-Commission Resolution 2000/7. *Minnesota Intellectual Property Review*, *5*, Retrieved September 24, 2007, from http://international.westlaw.com.

[121] *Ibid*.

[122] *Ibid*.

[123] Unlike prior IP agreements, TRIPS not only specifies the minimum substantive requirements for various forms of intellectual property. In addition, it requires its members to adopt 'effective' provisions within their national laws to permit the owners of intellectual property products to enforce their rights against those who infringe them (Article 41.1).

procedure. The Covenant requires that States Parties report periodically on their progress in achieving the rights in the respective treaties. These reports are reviewed by 18-member treaty bodies elected by the States Parties. The treaty bodies conclude their reviews of state reports by issuing concluding comments in which issues are raised and recommendations are made. When the government needs to make a further report, usually after a couple of years, these concerns should be the subject of attention. Moreover, unlike its 'confrere' ICCPR, ICESCR does not have any capacity to adjudicate complaints from the individual residents of the States Parties.[124] Indeed, human rights norms are principally implemented at the international level by persuasion and embarrassment rather than sanctions. Hence, there is an imbalance in the way international obligations are effectuated under TRIPS and human rights treaties.[125]

These enforcement provisions include detailed judicial and administrative remedies, border measures, and criminal procedures (Articles 41 to 61). To take just one example applied to plant varieties, a breeder whose new variety is sold commercially without its permission must be able to bring a civil judicial action seeking an injunction to stop the conduct of the unauthorized seller and to recover damages from him [Helfer, Laurence R. (2002). Intellectual Property Rights in Plant Varieties: An Overview with Options for National Governments. FAO Legal Papers Online, 32, Retrieved September 26, 2007, from http://www.fao.org].

[124] Human Rights Committee of ICCPR has the capacity to adjudicate complaints from the individual residents of the 104 nations that have ratified the Optional Protocol to the ICCPR. However, Committee decisions are not considered to be binding.

[125] Weissbrodt, David and Kell Schoff (2003). Human Rights Approach to Intellectual Property Protection: the Genesis and Application of Sub-Commission Resolution 2000/7. *Minnesota Intellectual Property Review*, *5*, Retrieved September 24, 2007, from http://international.westlaw.com.

4 TRIPS *sui generis* alternatives

Up to date, many of the developing countries are the Parties to the TRIPS Agreement, which makes it a common legal environment within which to find a prospectus neither to violate TRIPS' obligations nor to violate economic interests of developing world and human rights. The following is the analysis of the *sui generis* and other alternatives for an adequate balance between IPRs and HRs possible under the TRIPS regime.

4.1 Analysis of TRIPS-pled *sui generis* system

As discussed above (in 3.2.1.2), countries which are Parties to the TRIPS Agreement, provided they are not Parties to UPOV Convention, can enjoy a certain level of flexibility in establishing protection for plant varieties by means of *sui generis* system that could strike a relative balance between IPRs and HRs.

However, to qualify as an 'effective *sui generis* system' within the meaning of TRIPS Article 27.3(b) any national PVP law must contain four core elements: (1) the law must apply to all plant varieties in all species and botanical genera; (2) it must grant plant breeders an IPR, *i.e.* the exclusive right to control particular acts with respect to those protected varieties, or at a minimum, the right to remuneration *ad quod damnum* when third parties engage in certain acts; (3) it must provide national treatment and MFN[126] treatment to breeders from other WTO member states; and (4) it must contain procedures that enable breeders to enforce the rights granted to them under such a law.[127]

4.1.1 Requirement to protect all plant varieties

A diligent reading of TRIPS Agreement reveals that its States Parties are required to protect all varieties.[128] Article 27.3(b) states that "Members shall

[126] The most favoured nation (MFN) principle is a common feature of international trade agreements but has only recently been applied to IPRs. The principle extends the national treatment rule by compelling a government that provides a privilege or benefit to one state within a treaty system automatically to grant that same privilege or benefit to all states within the same system. The MFN principle thus prevents a subset of states within a larger treaty system from entering into bilateral or other special agreements among themselves, unless they grant the rights contained in those agreements to all other parties within the larger treaty system [Helfer, Laurence R. (2002). Intellectual Property Rights in Plant Varieties: An Overview with Options for National Governments. FAO Legal Papers Online, 32, Retrieved September 26, 2007, from http://www.fao.org].

[127] Leskien, Dan and Michael Flitner (1997).Intellectual Property Rights and Plant Genetic Resources: Options for a Sui Generis System. *Issues in Genetic Resources. 6*, p. 26.

[128] *Ibid*., at 27-28.

provide for the protection of *plant varieties*" without any further condition or qualification. Inasmuch as Article 27.3(b) is included in a provision of the TRIPS Agreement which provides for numerous and specific exceptions to patent protection, if the drafters had a good mind to allow states to limit the number or type of plant varieties subject to protection, they would have said so expressly. However, the obligation to protect all varieties does not necessitate for states to provide the same level of protection to each and every variety.[129]

Thus, excluding the plant varieties important for food (or medicines), assuring in such a manner the access of population to food (and health), is impossible without TRIPS violation; thus requiring 'indulgence' on the part of IP legislation with respect to human rights in order to draw up the adequate balance.

4.1.2 Requirement to grant a plant breeder an IPR

If protection of plant varieties did not take the form of an IPR, member states would enjoy virtually limitless discretion to opt the manner in which to protect plant varieties. The WTO Appellate Body construed the text of the TRIPS Agreement to require protection through an IPR, for Article 1.2 of TRIPS defines 'intellectual property' for purposes of the Agreement as "all categories of intellectual property that are the subject of Section 1 through 7 of Part II" of TRIPS. Protection for plant varieties appears in Section 5 relating to patents, and is thus a form of intellectual property protected by the Agreement.[130]

The consequence of this conclusion is that IPRs for plant varieties must be shaped according to the other IPRs protected by the TRIPS Agreement. Specifically, governments must either grant to the owners of protected varieties (1) the right to exclude all third parties from engaging in certain activities with respect to those varieties (an exclusive rights approach), or, (2) at a minimum, the right to receive equitable remuneration when a third party engages in such activities (a compulsory license approach).[131]

4.1.3 Requirement to provide national treatment and MFN treatment

The text of TRIPS Article 3.1, as construed by WTO dispute settlement legal specialists, points out that plant variety protection must accord to such

[129] Helfer, Laurence R. (2002). Intellectual Property Rights in Plant Varieties: An Overview with Options for National Governments. *FAO Legal Papers Online*, *32*, Retrieved September 26, 2007, from http://www.fao.org.
[130] *Ibid.*
[131] Leskien, Dan and Michael Flitner (1997).Intellectual Property Rights and Plant Genetic Resources: Options for a Sui Generis System. *Issues in Genetic Resources. 6*, p. 29.

obligations. The WTO Appellate Body emphasized the importance of the national and MFN treatment rules in multilateral trade agreements and it concluded that the obligation to grant such treatment applies to all subjects of intellectual property protected by TRIPS, a designation that includes *sui generis* protection of plant varieties.[132]

As a result, in the area of PVP, each member state must grant no less favourable treatment to the nationals of all other TRIPS members than it grants to its own nationals and it must also grant to such foreign nationals "any advantage, favour, privilege or immunity" granted to any other country. (TRIPS, Articles 3.1 and 4) In reference to plant varieties, this would mean that any IPR that a state provides to its own plant breeders must be provided to breeders from all other TRIPS members, and that any IPRs provided to breeders from one TRIPS member must be provided to breeders from all TRIPS members.[133]

4.1.4 Requirement to contain enforcement procedure

The only requirement that Article 27.3(b) imposes upon *sui generis* system for plant variety protection is that it be 'effective'. Although TRIPS does not define this term, it refers to it in Part III covering enforcement of other IPRs against acts of infringement by third parties. For this reason, a WTO dispute settlement panel is unlikely to find a *sui generis* system to be effective unless it provides a significant opportunity for private parties to enforce their rights in protected varieties.[134] Specific enforcement measures are not necessitated by the Agreement, however.

Therefore, taking into account all abovementioned criteria, 'an effective *sui generis* system' does not provide for an opportunity of affordable access by the population of developing countries to food or other essential plant resources grown from protected germplasm without inviting insupportable financial burden.

4.2 Compulsory licensing alternative

TRIPS comprises a complex set of rules that standardize when states may compel patent owners to license their products and processes to governments or to private parties. Although the TRIPS Agreement does not identify the grounds which validate the creation of compulsory licenses, because Article 5A.2 of the Paris Convention is incorporated by reference into Article 2.1 of TRIPS, it can be concluded that such licenses may be

[132] Helfer, Laurence R. (2002). Intellectual Property Rights in Plant Varieties: An Overview with Options for National Governments. *FAO Legal Papers Online*, *32*, Retrieved September 26, 2007, from http://www.fao.org
[133] *Ibid.*
[134] Leskien, Dan and Michael Flitner (1997).Intellectual Property Rights and Plant Genetic Resources: Options for a Sui Generis System. *Issues in Genetic Resources. 6*, p. 32.

granted only to prevent "abuses which might result from the exercise of the exclusive rights". Even where such abuses exist, TRIPS Article 31 imposes further conditions upon compulsory licenses granting, including respective consideration of each case, prior negotiations with the patent, or a protection certificate owner seeking a voluntary license, limitations on the scope and duration of compulsory licenses and mandating their termination when the circumstances leading to their creation are not longer in effect. Most importantly, patent (protection certificate) owners must enjoy 'adequate remuneration', according to *ad quod damnum* principle, taking into account the value of the rights licensed.[135]

Even if licenses to achieve these objectives are allowed, the limitations that TRIPS imposes significantly limit the ability of member states to grant such licenses in favour of third parties.[136] However, this alternative deems to be appropriate opportunity within current legal regime for developing world to sustain both standards of TRIPS obligations, and to assure the access of its economically immature population to social needs. In this case, the governments of developing countries will have to take the financial burden of compulsory licensing, which, *per se*, is a very heavy burden.

4.3 Other alternatives

However, none of the elaborated approaches to plant variety protection directly facilitates the other policy objectives under other international authorities, such as biodiversity, recognizing farmers' rights, and protecting the traditional knowledge of indigenous communities. TRIPS members have sufficient discretion to achieve both sets of objectives, however, by deviating from stringent adherence to the very TRIPS patent or *sui generis* 'offerings' or a UPOV model and adopting instead alternative forms of legal protection tailored to the particular needs of their societies and economies.[137]

The four eligibility requirements of the UPOV – novelty, distinctiveness, uniformity and stability – have been criticized as unnecessarily rigid, underrating plant genetic diversity, and disqualifying IPR claims by traditional farmers as opposed to breeders with commercial interests. TRIPS members need not duplicate these problems when crafting their *sui generis* legal systems. On the contrary, they are free to improve and develop upon each of the eligibility requirements.[138]

For instance, members can grant protection to plant germplasm that is more heterogeneous than conventional plant varieties but is still sufficiently distinct so as to allow its classification. Expanding protection to these

[135] Helfer, Laurence R. (2002). Intellectual Property Rights in Plant Varieties: An Overview with Options for National Governments. *FAO Legal Papers Online*, *32*, Retrieved September 26, 2007, from http://www.fao.org.
[136] *Ibid.*
[137] *Ibid.*
[138] *Ibid.*

heterogeneous varieties would permit farmers and indigenous communities to claim IPR protection in the landraces or plant varieties they have cultivated through traditional farming and breeding. Such protection would attend to demands for recognition of farmers' rights and traditional knowledge rights by using IPRs to balance the interests of farmers and local communities for preserving landraces and other traditional cultivated varieties and would provide them with a stimulus to continue their activities. It would also put a stop to third parties (including breeders in other nations) claiming exclusive rights in the varieties that farmers or indigenous communities have cultivated. It should be noted, however, that much of the plant-related knowledge possessed by these groups is unrelated to plant varieties as such, and thus demands for both sets of rights may not be fully satisfied by this approach.[139]

A state that provides for protection of heterogeneous varieties may grant exclusive rights either to individuals demonstrating their involvement in creating the heterogeneous variety or to farmers' or indigenous communities. In any case, states will have to develop a mechanism to distinguish between two or more heterogeneous varieties, a task that may invite defining minimum genetic distances between varieties. And the latter choice may be hard, as recognition of group rights is an introduction of intellectual property law and governments have only recently begun to consider how these rights might be arranged. Finally, protection of heterogeneous varieties provides for a greater potential for overlapping claims by breeders. It may therefore be advisable to narrow the exclusive rights or term of protection granted to such varieties to limit such conflicts.[140]

To support better genetic diversity, commentators[141] have proposed a more flexible 'distinctness and identifiability' standard which substitute the UPOV's narrow focus on precise physical properties of plant varieties with an assessment of many different characteristics by which a particular variety may be identified.[142]

Further to the eligibility requirements required by the UPOV Acts, states may establish additional conditions upon the grant of protection as a means of implementation of their CBD obligations. These conditions include a declaration of origin of the plant germplasm in question and a requirement that the entity seeking protection have obtained the prior informed consent of the country or community of origin.[143]

---

[139] Helfer, Laurence R. (2002). Intellectual Property Rights in Plant Varieties: An Overview with Options for National Governments. *FAO Legal Papers Online*, *32*, Retrieved September 26, 2007, from http://www.fao.org.
[140] *Ibid*.
[141] Leskien, Dan and Michael Flitner (1997).Intellectual Property Rights and Plant Genetic Resources: Options for a Sui Generis System. *Issues in Genetic Resources. 6*, p. 53.
[142] Helfer, *supra* note 139.
[143] *Ibid*.

When a state has defined the eligibility requirements and conditions determining which varieties to be protected under its national laws, it must then decide whether to alter the other elements of the *sui generis* breeders' right, including protected subject matter, exclusive rights, term of protection and exceptions and limitations to exclusive rights. Each of these elements is open to modification by TRIPS members.[144]

Nations with extensive agriculture or plant breeding manufacturing sectors are likely to benefit by adopting relatively rigid IPR protection, with a broad spectrum of exclusive rights, an expansive list of protected material and relatively limited exceptions and limitations. Such a strong protection mechanism will facilitate exports of harvested products, imports of propagating materials, and investment by foreign actors.[145]

Countries the agricultural systems of which are domestically focused or rely upon the cultivation of traditional varieties by small-scale farmers come across a different set of interests and stimuli. Their populations are likely to favour relatively weak IPR protection with a broad farmers' privilege that allows farmers to both save and exchange seeds. A very weak protection is not advisable, however, as it will discourage foreign breeders from introducing to local markets seeds or other propagating material (which may be an important component of the nation's food supply) and may deter investment by foreign businesses or researchers for whom IPR protection is essential.[146]

States with combined agricultural economies may benefit from introducing different levels of protection customized to the needs of their domestic industries. For example, they may implement different standards of protection for commercial and non-commercial breeders, with higher standards for the former to compensate them for their investments. They may also allow protection of the same variety with both a breeders' right and a patent (for example, in countries where both classical breeding methods and methods making use of genetic manipulation are prevalent). Equally, such countries may adopt different exclusive standards for specific varieties. Strong IP protection in the form of a patent may be used to encourage the creation of new ornamental and high-value export crops without harming domestic consumers, whereas breeders' rights may be used for other species where the state seeks to balance IPR protection against the interests of farmers.[147]

Another approach that deserves consideration is the "privilege use of varieties derived from germplasm of local origin"[148]. This privilege, which

---

[144] Helfer, Laurence R. (2002). Intellectual Property Rights in Plant Varieties: An Overview with Options for National Governments. *FAO Legal Papers Online*, *32*, Retrieved September 26, 2007, from http://www.fao.org.
[145] *Ibid.*
[146] *Ibid.*
[147] *Ibid.*
[148] *Ibid.*

could be shaped as either an exemption or a compulsory license, would allow the residents of a state, without the permission of the right holder, to use plant varieties derived from germplasm collected in that state. There are several difficulties with this 'local origin' privilege, however.[149]

Difficulties can arise when a certain plant can be shared as a part of common regional agricultural tradition by different communities residing in different countries of the same region. Thus, a plant variety based on a germplasm collected in States A can be free for use for framers of State A, when farmers of State B of the region do not enjoy this privilege although the very same germplasm is also a part of State B's traditional agriculture and has been cultivated by the farmers of State B *pari passu* with the farmers of State A.

This exemption may as well undermine the domestic breeding industry in states where breeders collect germplasm locally. For this reason, a state may be tempted to apply the local origin exemption only to foreign breeders. However, such a limitation would clearly violate the national treatment rule and thus be incompatible with the core obligations of TRIPS Article 27.3(b).[150]

A way to recognize the rights of indigenous communities could be to privilege their traditional uses of plant varieties; a vague term that could be defined to comprise uses that indigenous communities have traditionally and regularly engaged in as part of their agricultural or cultural practices. Such an exemption would likely be compatible with Article 27.3(b) on condition that the state defined in detail the types of customary uses permitted under its laws and secured equitable remuneration to breeders in the event that the exemption was very broad. Leaving this concept vague would involve abuses, particularly in countries that also chose to adopt minimal procedures for breeders to enforce their rights.[151]

[149] Helfer, Laurence R. (2002). Intellectual Property Rights in Plant Varieties: An Overview with Options for National Governments. *FAO Legal Papers Online, 32*, Retrieved September 26, 2007, from http://www.fao.org.
[150] *Ibid.*
[151] *Ibid.*

5 Main international fora

This chapter will examine the deliberations of the main international fora involved in intellectual property and access to food with regard to the problematics under consideration in this work. The fora discussion as presented here does not include all fora relating in their activity to the subject matter of the given work and, therefore, is limited to World Intellectual Property Organization, and Food and Agriculture Organization.

5.1 WIPO

World Intellectual Property Organization is the main international forum and aegis of intellectual property rights. Recently, WIPO is getting more involved in the issues of discordant views and interests of intellectual property and human rights giving its floor the discussion.

5.1.1 WIPO and Human Rights

The WIPO in collaboration with the United Nations Office of the High Commissioner for Human Rights (OHCHR) organized and held a Panel discussion on the relations between IP and HR on 9 November 1998. The event was organized within the context of the 50th Anniversary of the UDHR.[152]

The Panel touched upon the role of intellectual property in economic, social and cultural development and highlighted the 'universality' of human rights. The participants expressed their concerns in the field of IP and HR conflicts.[153] Although the events alike are highly welcomed by the human rights professionals, the very Panel proved to be a yet another single-shot forum never to resume thus far, which failed to yield any palpable outcomes.

5.1.2 The WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore

At its Twenty-Sixth Session, held in Geneva from 26 September to 3 October 2000, the WIPO General Assembly established an Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (IGC).[154] As to date, the

[152] Press Release PR/98/143. Retrieved October 1, 2007, from WIPO Web site: http://www.wipo.int/edocs/prdocs/en/1998/wipo_pr_1998_143.html.
[153] *Ibid.*
[154] McManis, Charles R. (Summer 2003). Intellectual Property, Genetic Resources and Traditional Knowledge Protection: Thinking Globally, Acting Locally. *Cardozo Journal of*

IGC met eleven times and has been dealing with a range of issues in regard to genetic resources. The IGC sets a high value on the cooperation with the Conference of Parties (COP) of the CBD, the FAO's Commission on Genetic Resources for Food and Agriculture (CGRFA) and the United Nations Environment Programme (UNEP).

The work has covered three areas:[155]

- Defensive protection of genetic resources through measures which prevent the grant of patents over genetic resources that do not fulfill the requirements of novelty and non-obviousness.

- Disclosure requirements in patent applications that relate to genetic resources and associated TK[156] used in a claimed invention.

Dealing with the patentability requirements for genetic resources (not only of plant origin), the IGC impliedly brings the issue of PVP to the niche of patent law thus distancing itself from the discussion of such PVP alternatives as *sui generis* system for providing protection to these specific IPRs. The task the IGC is centering under the above area is limited to tuning and 'debagging' the system of patent granting. Thereby, any plant variety meeting the novelty and then the non-obviousness requirement can be protected with a patent.

- IP aspects of access to genetic resources and equitable benefit-sharing arrangements that govern use of genetic resources.

Although the question of equitable benefit sharing is highly important from the IPRs holders' perspective, it, unfortunately, does not solve the problem of HRs violations in the field. Moreover, it is very hard to technically come up with a legally clear holder of traditional knowledge rights (with which the genetic resources can be associated) to execute the share of benefits. At the same time executing the exclusive rights over a plant being in use by local farmers and belonging to a plant variety protected by a patent or a *sui generis* system makes the benefit sharing with the very community to which the farmers belong be out of sound.

5.2 The FAO Commission on Genetic Resources for Food and Agriculture

The FAO Commission on Genetic Resources for Food and Agriculture (CGRFA) was originally established by the FAO Conference in 1983 as the Commission on Plant Genetic Resources (CPGR). In 1995 its mandate was broadened to cover "agro-biodiversity of relevance to food and

---

International and Comparative Law, 11, Retrieved September 30, 2007, from http://international.westlaw.com.

[155] IGC, Genetic Resources. Retrieved September 30, 2007, from WIPO Web site: http://www.wipo.int/tk/en/genetic/.

[156] Traditional knowledge.

agriculture"[157] including animal genetic resources, and was then renamed. CGRFA is a permanent forum for governments to deal with the issues of plant genetic resources for food and agriculture. The objectives that the CGRFA designated to achieve are "to ensure the conservation and sustainable utilization of genetic resources for food and agriculture, as well the fair and equitable sharing of benefits derived from their use, for present and future generations"[158].

The CGRFA has 165 member countries, a number that has been fairly static for several years, though it is open to all FAO members and associate members. The CGRFA makes its decisions by consensus, but a 'one country, one vote' approach to decision making can be taken when necessary. The CGRFA meets biennially and operates through Intergovernmental Technical Working Groups. It spends most of its time serving as a political forum, debating issues of policy for PGRs activities.[159]

The CGRFA is engaged in conservation and utilization of genetic resources for food and agriculture, developing and monitoring of the Global Strategy for the Management of Farm Animal Genetic Resources; and the Global System for Plant Genetic Resources.[160]

5.2.1 The Global System on Plant Genetic Resources

The development of the Global System began in 1983 at the time of establishing the then CPGR with the aim to ensure the safe conservation and to promote the availability and sustainable use of PGRs by means of a flexible framework for sharing the benefits and burdens.[161]

The System originally consisted of just a soft law framework (*i.e.*, the IUPGR that has now evolved into the ITPGR) and an intergovernmental forum (the CPGR). To bring together other disparate international PGRs management efforts, the Global System has been extended to include: Codes of Conduct and Guidelines; cooperative networks for PGRs conservation and delivery; an expanding information base on global holdings and erosion of PGRs; and a global PGRs management program. These parts are not highly integrated but are gradually becoming more coherent.[162]

---

[157] Commission on Genetic Resources for Food and Agriculture. Retrieved October 2, 2007, from FAO Web site: http://www.fao.org/AG/cgrfa/default.htm.
[158] Commission on Genetic Resources for Food and Agriculture. Retrieved October 2, 2007, from FAO Web site: http://www.fao.org/AG/cgrfa/default.htm.
[159] Rose, Gregory (Summer 2003). International Law of Sustainable Agriculture in the 21st Century: the International Treaty on Plant Genetic Resources for Food and Agriculture. *Georgetown International Environmental Law Review*, *15*, Retrieved September 15, 2007, from http://international.westlaw.com.
[160] Commission on Genetic Resources for Food and Agriculture (CGRFA), *supra* note 158.
[161] CGRFA, Plant Genetic Resources. Retrieved October 2, 2007, from FAO Web site: http://www.fao.org/AG/cgrfa/PGR.htm#ITWG.
[162] Rose, *supra* note 159

One of the key elements of the Global System is the Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture adopted in June 1996 by the Fourth International Technical Conference in Leipzig.[163]

5.2.2 The Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture; and the Leipzig Declaration

This legally non-binding Plan together with the Leipzig Declaration was formally adopted by the representatives of 150 countries to center the attention of world governments and NGOs to the problems of plant genetic resources and world food security. The Plan containing twenty chapters organized into four sections provides for a major concern with regard to the main problems in access to plant genetic resources and threats thereto reaffirming them as the most fundamental and essential resources on Earth; as well as centers its attention to the rights of farmers.

The 1996 Conference was designed to develop funded programs to make the Global System fully operational. Financing was controversial, and the Plan was adopted at Leipzig without a resolution of the funding issue. Although the 1996 Conference recognized the need for mobilization of financial resources no additional funds were forthcoming. The CGRFA Secretariat was requested to refine costing in light of changes introduced into the Plan at the 1996 Conference. Those changes were aimed at less duplication, better coordination, and better prioritization. The Global Plan of Action has since progressed through a series of regional strategy meetings held in 1998, seeking to mobilize and coordinate the resources of international organizations, governments, and NGOs. The CGRFA Secretariat has been revising and representing funding proposals at CGRFA meetings, without success, so existing funds, programs, and institutional resources are still being deployed.[164]

5.2.3 Intergovernmental Technical Working Group on Plant Genetic Resources for Food and Agriculture

At its seventh session in May 1997 the CGRFA established Intergovernmental Technical Working Group on Plant Genetic Resources (ITWG-PGR) to address issues concerning the genetic resources for food

[163] CGRFA, Plant Genetic Resources. Retrieved October 2, 2007, from FAO Web site: http://www.fao.org/AG/cgrfa/PGR.htm#ITWG.
[164] Rose, Gregory (Summer 2003). International Law of Sustainable Agriculture in the 21st Century: the International Treaty on Plant Genetic Resources for Food and Agriculture. *Georgetown International Environmental Law Review*, *15*, Retrieved September 15, 2007, from http://international.westlaw.com.

and agriculture. Its duties are to review the issues related to agro-biodiversity in the area of PGRs for food and agriculture and advise the Commission on the matters, as well as to consider the progress made in the Commission's work plan.[165]

[165] CGRFA, Plant Genetic Resources. Retrieved October 2, 2007, from FAO Web site: http://www.fao.org/AG/cgrfa/PGR.htm#ITWG.

6 Experience of plant variety protection in developing world

The world's major provisions of plant genetic resources for food and agriculture are located in geographic areas with the highest levels of plant inter- and intra-specific genetic multiplicity. These areas, first identified in the 1920s by the Russian geneticist Vavilov, reveal that the plants that comprise humanity's primary food staples have their origins in the tropical and sub-tropical zones of Asia, Africa, and Latin America.[166]

6.1 Africa

Africa has an abundance of diversity: diversity of biological resources, as well as diversity of culture. It is estimated that Africa with more than 2000 different ethnic groups is the home for at least a quarter of the world's biological diversity.[167] The introduction of plant variety protection in African countries is a novelty for all but a few states. Some of the problems they have encountered on the road to developing plant variety protection regimes have been the time pressure forced upon them by TRIPS implementation deadlines and the pressure brought upon them to adopt an existing plant variety protection regime which was formulated predominantly for developed countries.[168]

6.1.1 African Union and the Model Law

Africa is a very good example of collective concern over a common problem. To cope with the challenges, the Organization of African Unity (OAU), now the African Union (AU), developed African Model Legislation (Model Law) for the Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources which has outlined an approach to deal with plant variety protection and access to biological resources, as well as provided for

[166] Rose, Gregory (Summer 2003). International Law of Sustainable Agriculture in the 21st Century: the International Treaty on Plant Genetic Resources for Food and Agriculture. *Georgetown International Environmental Law Review, 15*, Retrieved September 15, 2007, from http://international.westlaw.com.

[167] Collier, Debbie (May 2006). Access to and Control over Plant Genetic Resources for Food and Agriculture in South and Southern Africa: How Many Wrongs before a Right? *Minnesota Journal of Law, Science & Technology, 7*, Retrieved October 3, 2007, from http://international.westlaw.com.

[168] Barron, Nadine and Ed Couzens (2004). Intellectual Property Rights and Plant Variety Protection in South Africa: an International Perspective. *Journal of Environmental Law, 16*, Retrieved September 20, 2007, from http://international.westlaw.com.

farmers' rights and benefit sharing principles.[169] It is based on the rejection of patents of life, and its provisions on access to biological resources make it clear that the recipients of biological resources or related knowledge cannot apply for any intellectual property right of an exclusionary nature.[170] Most of the Member States of AU have adopted national legislation in accordance to the Model Law.

The model law focuses for the most part on defining the rights of communities, farmers and breeders and acknowledges that local communities possess certain rights over their biological resources and the technologies that have evolved over generations and are *a priori* rights of a collective nature that take precedence over rights based on private interests.[171] The state is to ensure that at least 50 percent of the benefits derived from the utilization of their resources or knowledge is channeled back to the communities. The positive element in the AU Model Law is that there is a collective effort by a group of countries to pool resources to implement some aspects of the CBD and of the TRIPS Agreement.[172]

The African Model Law seeks to implement the relevant provisions of the CBD and applies to biological resources in both *in situ* and *ex situ* conditions, derivatives of biological resources, community knowledge and technologies, local and indigenous communities, and plant breeders. Access to such biological resources, knowledge, or technologies of local communities is granted by submitting an application for prior informed consent and a written permit. The application to the National Competent Authority must disclose the full details of the project for which the resource is required, including the purpose for which access to the resource is requested, the risks to biological diversity, and the proposed mechanisms and arrangements for benefit sharing. The sharing of benefits based upon customary practices of local communities does not apply to "any person or persons not living in the traditional and customary way of life"[173].[174]

Prior informed consent is also required from the concerned local community, including its female members. An access permit is granted through a signed written agreement among the three parties: the National Competent Authority, the community or communities concerned, and the

---

[169] Kongolo, Tshimanga and Folarin Shyllon (2004). Panorama of the Most Controversial IP Issues in Developing Countries. *European Intellectual Property Review*, *26 (6)*, Retrieved October 3, 2007, from http://international.westlaw.com.
[170] Barron, Nadine and Ed Couzens (2004). Intellectual Property Rights and Plant Variety Protection in South Africa: an International Perspective. *Journal of Environmental Law*, *16*, Retrieved September 20, 2007, from http://international.westlaw.com.
[171] Collier, Debbie (May 2006). Access to and Control over Plant Genetic Resources for Food and Agriculture in South and Southern Africa: How Many Wrongs before a Right? *Minnesota Journal of Law, Science & Technology*, *7*, Retrieved October 3, 2007, from http://international.westlaw.com.
[172] Barron and Couzens, *supra* note 170.
[173] OAU/STRC Task Force Declaration on Community Rights and Access to Biological Resources, (March 1998). International Environmental Law Project. Retrieved October 3, 2007, from Lewis & Clark College Web site: http://www.lclark.edu/org/ielp/oau.html.
[174] Collier, *supra* note 171.

applicant or collector. The contents of this tripartite agreement are regulated by Article 8 of the African Model Law. Specifically, the agreement requires the collector to contribute financially to the efforts of the state and communities concerned in the regeneration and conservation of the biological resource. The collector may only apply for intellectual property protection of the biological resource, or parts or derivatives thereof, or for community knowledge or technology with the additional prior informed consent of the original providers. Article 9 then goes on to provide that patents over life forms and biological processes will not be recognized and cannot be applied for, but does provide for plant breeders' rights.[175]

The African Model Law recognizes and protects community rights, farmers' rights, and plant breeders' rights, and challenges the suitability of intellectual property protection systems, particularly patent law, for developing countries where the main concern is often to secure food and to fight poverty.[176]

In September 2000, African Ministers of Trade invited the UPOV and WIPO to comment on the model law. What ensued was not comment, but an attempt completely to reorganize the model law in order to bring it into line with UPOV and WIPO's intellectual property systems. WIPO noted that the prohibition on patents contained in the model law is inconsistent with TRIPS Article 27.3(b). The WTO further objected to the embodiment of the principle that the collectors of biological resources in Africa are required to assure that they will not apply for patents over such materials or their derivatives, contained in the model law. Underlying this objection can be viewed, but necessarily acts, as the barrier WIPO poses to the securing of monopolies on such resources or their derivatives. Perhaps the most important objection was WIPO's opposition to the concept that indigenous technology is not transferable to another owner. This concept ensures that no one, including members of a local community, can make exclusive claims over community knowledge or resources. WIPO suggested that local communities apply for patent protection themselves as a solution to the problem. This shows that WIPO, rather than assisting constructively in the development of the model law, attempted to solve the problem utilizing existing global IPR conventions, which are ill equipped effectively to protect indigenous knowledge in Africa.[177]

In the Declaration by the OAU/STRC Task Force[178], it was stated that "the WTO-based approach is predatory in nature and runs counter to the

---

[175] Collier, Debbie (May 2006). Access to and Control over Plant Genetic Resources for Food and Agriculture in South and Southern Africa: How Many Wrongs before a Right? *Minnesota Journal of Law, Science & Technology*, *7*, Retrieved October 3, 2007, from http://international.westlaw.com.

[176] *Ibid*.

[177] Barron, Nadine and Ed Couzens (2004). Intellectual Property Rights and Plant Variety Protection in South Africa: an International Perspective. *Journal of Environmental Law*, *16*, Retrieved September 20, 2007, from http://international.westlaw.com.

[178] Science, Technology and Research Commission of Organization of African Unity; Task Force on Community Rights and Access to Biological Resources.

aspirations of communities which are in the first place the innovators of biodiversity so necessary for the survival of the planet"[179]. UPOV officials, on the other hand, reworked more than thirty articles of the model law to bring it into line with the standards of their own convention.[180]

6.1.2 South Africa

In South Africa, a plethora of policy documents and legislation pertaining to plant genetic resources for food and agriculture is in place that appears, on the surface at least, to comply with the major doctrine of both the TRIPS and CBD agreements. Of significance are the Patents Act 57 of 1978 and the Plant Breeders' Rights Act 15 of 1976.[181]

The Patents Act provides that a patent may be granted for any new invention involving an inventive step and which is capable of being used or applied in trade, industry, or agriculture. A patent shall not be granted, however, "for any variety of animal or plant or any essentially biological process for the production of animals or plants, not being a microbiological process or the product of such a process".[182]

The Plant Breeders' Act provides "for a system whereunder plant breeders' rights relating to varieties of certain kinds of plants may be granted and registered" and essentially corresponds with the model offered by UPOV meeting South Africa's obligations arising out of Article 27.3(b) of the TRIPS Agreement.[183]

The Plant Breeders' Act does not require the prior informed consent of affected communities and does not provide for material transfer or benefit sharing agreements. A plant breeder's right is granted for twenty-five years with respect to vines and trees and twenty years for everything else.[184]

However, where a person has obtained propagating material of a protected variety in a legitimate matter, it shall not be an infringement to resell the propagating material or any plant or product derived from the propagating material, or to use or multiply the propagating material in the development of a different variety. Neither is it an infringement to use the propagating material for *bona fide* research or private or non-commercial

---

[179] OAU/STRC Task Force Declaration on Community Rights and Access to Biological Resources, (March 1998). International Environmental Law Project. Retrieved October 3, 2007, from Lewis & Clark College Web site: http://www.lclark.edu/org/ielp/oau.html.
[180] Barron, Nadine and Ed Couzens (2004). Intellectual Property Rights and Plant Variety Protection in South Africa: an International Perspective. *Journal of Environmental Law, 16*, Retrieved September 20, 2007, from http://international.westlaw.com.
[181] Collier, Debbie (May 2006). Access to and Control over Plant Genetic Resources for Food and Agriculture in South and Southern Africa: How Many Wrongs before a Right? *Minnesota Journal of Law, Science & Technology, 7*, Retrieved October 3, 2007, from http://international.westlaw.com.
[182] *Ibid.*
[183] *Ibid.*
[184] *Ibid.*

purposes, nor where the person who acquires the material is a farmer who uses harvested material obtained on land occupied by him from the propagating material for purposes of propagation, provided that the harvested material shall not be used for propagation by any person other than that farmer. Sections 26 and 27 of the Plant Breeders' Act provide mechanisms and principles for the application for and granting of a compulsory license to deal with a protected plant variety where the holder of a plant breeder's right has unreasonably refused to grant a license or has imposed unreasonable conditions.[185]

6.2 Asia

Intellectual property protection poses the danger of creating a genetic monopoly on agricultural staples in Asia, where a number of developing countries are geographically clustered. For example, the important rice crop is particularly vulnerable to monopolistic control. Rice is the Asia's number one harvested grain, as it accounts for 80 percent of the daily caloric intake of Asia's population. Ninety percent of the world's rice grains are harvested on nearly 150 million hectares of Asian fields. Harvested rice grains comprise nearly half of Asia's farm incomes. Over centuries, local farmers have cultivated a plethora of genetic diversity in the rice crop in Asia. Scientists believe rural communities have developed an estimated 140,000 different types of rice varieties over the years.[186]

6.2.1 China

China promulgated its Regulations on the Protection of New Varieties of Plants (Regulations) on March 20, 1997, which took effect on 1 October 1997. The objective of the Regulations is to establish and protect "property rights in new plant varieties ('variety rights') to foster the development of agriculture and forestry by creating a regime for the breeding and utilization of such varieties".[187]

The Regulations permits a foreigner to apply for variety rights for certain listed varieties in China. Based on the principle of reciprocity, the approval authority will grant such foreigner the variety rights in accordance with the relevant bilateral treaty or international convention. This only applies when both China and the foreign country are parties to a bilateral treaty or a relevant international authority. Additionally, when seeking the

[185] Collier, Debbie (May 2006). Access to and Control over Plant Genetic Resources for Food and Agriculture in South and Southern Africa: How Many Wrongs before a Right? *Minnesota Journal of Law, Science & Technology*, *7*, Retrieved October 3, 2007, from http://international.westlaw.com.
[186] Nguyen, Lory (Autumn 2004). Vietnam's 2005 Accession Bid to the WTO: the Harmful Effects Facing Less Developed Countries. *Journal of Law & Social Challenges*, *6*, Retrieved October 4, 2007, from http://international.westlaw.com.
[187] Ding, Chengfei (Autumn 2001). The Protection of New Plant Varieties of American Business in China after China Enters WTO. *Drake Journal of Agricultural Law*, *6*, Retrieved October 4, 2007, from http://international.westlaw.com.

protection under the Regulations, the applicant must show the variety meets the tests of novelty, distinctiveness, consistency and stability. The variety must also have a proper name.[188]

Under the Regulations, the variety rights holder normally has the exclusive right to own the plant variety, the duration of which depends on a particular plant type. Without authorization of the variety rights holder, others are forbidden to produce and market the plant variety for commercial purposes. Unauthorized persons are also prohibited to use the plant variety in producing new varieties for commercial purposes. However, this prohibition is subject to the exceptions under Article 10 of the Regulations. The two exceptions under Article 10 are: (1) Unauthorized persons may use the variety for the purpose of breeding new varieties and other scientific research activities. (2) Farmers may keep breeding material for their own use.[189]

In addition to the exceptions in Article 10, the compulsory licensing provision in Article 11 provides another avenue for a person other than the variety rights holder to use the new variety when the variety rights holder declines to authorize such person to use his/her protected variety. Under Article 11, the approval authority can compel a variety rights holder to license its new plant variety to others. The Regulations does not limit the scope of licensees. Therefore, the licensees may include the competitors of the variety rights holder. This makes Article 11 a robust requirement for variety rights holders.[190]

On 23 April 1999 China joined the UPOV 1978 Act with the declaration that this Act is not applicable to the Hong Kong Special Administrative Region.

6.2.2 India

India became a member of the World Trade Organization on 1 January 1995. As a member, India was required to comply with the TRIPS Agreement, specifically, Article 27.3(b). Choosing to comply with the *sui generis* option, the Indian Parliament passed the Protection of Plant Varieties and Farmer's Rights Act (PPVFR), in August 2001.[191] The purpose of PPVFR is "to provide for the establishment of an effective system for protection of plant varieties, the rights of farmers and breeders, [and] to encourage the development of new varieties of plants …"[192]

---

[188] Ding, Chengfei (Autumn 2001). The Protection of New Plant Varieties of American Business in China after China Enters WTO. *Drake Journal of Agricultural Law*, *6*, Retrieved October 4, 2007, from http://international.westlaw.com.
[189] *Ibid.*
[190] *Ibid.*
[191] Ott, Robyn (2004). Protection of Plant Varieties and the Farmer's Rights Act. *Oklahoma Journal of Law & Technology*, *2*, Retrieved October 4, 2007, from http://international.westlaw.com.
[192] Protection of Plant Varieties and Farmer's Rights Act. Retrieved October 5, 2007, from GRAIN Web site: http://www.grain.org/brl_files/india-pvp-2001-en.pdf.

The key element of PPVFR is the protection of intellectual property rights for plant varieties by a registration process. Under this process, four types of varieties can be registered. Through the registration process, both breeders and farmers of the plant varieties are protected and given rights. PPVFR further gives rights to researchers, the government, and the public.[193]

Under PPVFR, any person claiming to be the breeder of the variety, successor or assignee of the breeder; any farmer, group of farmers; university or publicly funded agricultural institution claiming to be the breeder can register any of the four types of varieties. These types of varieties are: new varieties, extant varieties, essentially derived varieties, and farmers' varieties.[194]

Although India is not a Party to UPOV Convention, in order to be classified as a new variety, the variety must conform to the criteria of novelty, distinctiveness, uniformity, and stability. Normally, existing plant breeders will register for a new variety. These breeders include private sector breeders registering for their variety's protection and public sector institutions and universities "if they innovate and produce new varieties".[195]

The essentially derived variety is a variety that is "identical to the parent variety save a single character change". The essentially derived variety can be derived directly from a parent variety, or can come from a variety that was predominantly derived from a parent variety. The essentially derived variety must keep the essential characteristics that result from the initial variety's genotype, but at the same time must be clearly distinct from the initial variety. India's concept of an essentially derived variety differs from that of UPOV which gives the initial breeder the rights over essentially derived varieties. PPVFR, however, gives the rights to breeders who develop the essentially derived variety. The essentially derived variety breeder is required, however, to obtain authorization from the initial breeder when the initial variety will be used repeatedly as a parental line for commercial production of a newly developed variety.[196]

An extant variety is a broad category covering varieties available in India that are notified under section 5 of the Seeds Act, 1966; farmers' varieties; varieties of common knowledge; or any other variety that is in the public domain. Unlike other varieties protected under PPVFR, an extant variety protects existing varieties. The extant variety, therefore, is not

[193] Ott, Robyn (2004). Protection of Plant Varieties and the Farmer's Rights Act. *Oklahoma Journal of Law & Technology, 2*, Retrieved October 4, 2007, from http://international.westlaw.com.
[194] *Ibid.*
[195] *Ibid.*
[196] *Ibid.*

required to show novelty. However, distinctness, uniformity, and stability must still be established.[197]

The farmers' variety will normally be registered by farmers. This variety is a variety "which has been traditionally cultivated and evolved by the farmers in their fields, or is a wild relative or land race of a variety about which farmers possess a common knowledge". As a result, novelty will not be a criterion necessary for registration. PPVFR is imprecise, however, on whether distinctness, uniformity, and stability are required for the farmers' variety.[198]

Under PPVFR, a breeder is "any person or group of persons or a farmer or group of farmers or any institution which has bred, evolved or developed any variety". For new varieties and essentially derived varieties, breeders or their successors, agents or licensees, are extended the exclusive right to "produce, sell, market, distribute, import or export" their variety. Essentially, the breeders are entitled to control the formal marketing, production, and commercialization of their variety. [199]

The extant variety breeder also has these same exclusive rights, but only if the breeder claims the right. The breeder must register for protection within in a specified period, which is to be determined by the Authority. When breeders do not establish their right to the variety, the Central Government and, in certain cases, the State Government will be deemed to be the owner of the right. PPVFR is unclear on what the Government is to do with its ownership. Perhaps, the ownership is for the public domain, but this question is unsettled.[200]

PPVFR gives farmers the right to "save, use, sow, resow, exchange, share or sell farm produce including seed of a variety protected under this Act ... provided that the farmer shall not be entitled to sell branded seed of a variety protected under this Act". As a result, farmers are entitled to sell locally any variety of seed that they grow, even if the variety has been granted a breeders' right. The farmers are prohibited; however, from selling seed that is 'branded' by being packaged and labeled in a way indicating that the seed is protected under PPVFR. As a result, farmers are permitted to sell the breeders' seed under another denomination. Farmers are also protected from terminator technology, meaning breeders are forbidden from marketing a variety that prohibits a plant from germinating a second time. In addition, breeders are required to disclose to farmers the expected performance of the variety under given conditions. If the propagating

---

[197] Ott, Robyn (2004). Protection of Plant Varieties and the Farmer's Rights Act. *Oklahoma Journal of Law & Technology, 2*, Retrieved October 4, 2007, from http://international.westlaw.com.
[198] *Ibid.*
[199] *Ibid.*
[200] *Ibid.*

material fails to perform as specified under the given conditions, farmers may claim compensation from the breeders.[201]

Furthermore, when breeders use the farmers' variety to breed a new variety, the breeders must pay a royalty into the National Gene Fund. This benefit sharing gives rights and rewards to farmers for contributing to the creation of new varieties of agriculture. Also, farmers are granted an exemption from infringing on any PPVFR right when the farmers at the time of the infringement, did not know of the existence of the right. Finally, farmers will receive all the rights and protections of a breeder, if the farmer breeds or develops a new variety.[202]

Although the breeders' and farmers' varieties are protected, PPVFR allows any person to use any registered variety for conducting experiments or research, and also allows any person to use a registered variety as an initial source for the purposes of creating other varieties. This provision, however, implements a restriction on the use of a registered variety "where the repeated use of such variety as a parental line is necessary for commercial production of such other newly developed variety". In such circumstances, the initial breeders' authorization is needed.[203]

PPVFR includes clauses that exclude certain varieties from protection because of public interest, and gives an option for a compulsory license if the public interest is not fulfilled. Registration of a variety is not allowed under PPVFR where prevention of commercial exploitation of the variety is necessary to "protect public order or public morality or human, animal and plant life and health or to avoid serious prejudice to the environment".[204]

6.3 Latin America

The Common Industrial Property Regime (CIPR) within the framework of the Andean Community of Nations[205] (CAN) regulates all IP issues of CAN's Member Countries. The CIPR incorporates all the substantive aspects of TRIPS, such as national treatment and MFN treatment.[206]

The Common Regime for the Protection of the Rights of Creators of Plant Varieties (Decision 486) states that any person in the Andean sub-

[201] Ott, Robyn (2004). Protection of Plant Varieties and the Farmer's Rights Act. *Oklahoma Journal of Law & Technology, 2,* Retrieved October 4, 2007, from http://international.westlaw.com.
[202] *Ibid.*
[203] *Ibid.*
[204] *Ibid.*
[205] A trade bloc comprising the Latin American Countries of Bolivia, Colombia, Ecuador, Peru, and Venezuela (left CAN but has intention to rejoin) as members; Argentina, Brazil, Chile, Paraguay, Uruguay as associate members; and Mexico and Panama as observing countries.
[206] Tafur-Domínguez, Victor (Autumn 2000). International Environmental Harmonization - Emergence and Development of the Andean Community. *Pace International Law Review, 12,* Retrieved October 8, 2007, from http://international.westlaw.com.

region, who creates or obtains a new variety of plant by applying scientific knowledge will enjoy the exclusive right to produce and market that plant for a period of fifteen to twenty-five years, depending on their species.[207]

The competent authorities in each of the Andean Member Countries recognize and guarantee those rights by issuing a Creator's Certificate. In order for a plant variety to gain protection, it must have certain basic characteristics: it must be new, different, homogeneous, and stable. 'New' means the variety cannot have been exploited commercially. 'Different' means that it must be clearly distinguishable from any other known variety at the time the application is submitted. 'Homogeneous' means that the essential characteristics must be sufficiently uniform. 'Stable' means that its essential characteristics must remain unchanged from generation to generation as well as at the end of each particular reproduction, multiplication, or propagation cycle. To obtain the Creator's Certificate, a person must also invest scientific expertise, develop the plant variety in a homogeneous and distinguishable manner, and keep it unchanged over time. Only then can the new plant adopt an appropriate generic name.[208]

To address the concern of discrimination against traditional farmers and Indians communities, the Decision 345 provides for two protective mechanisms. First, Article 30 empowers States to declare free use of the protected variety for reasons of natural security or public interest. Second, Article 26 suggests that if an individual shows and reserves for his own use, or sells as raw material or food, the product obtained by growing the protected variety, do not encroach upon the rights of the creator. A producer who engages in subsistence farming, therefore, does not have to pay royalties.[209]

[207] Tafur-Domínguez, Victor (Autumn 2000). International Environmental Harmonization - Emergence and Development of the Andean Community. *Pace International Law Review, 12*, Retrieved October 8, 2007, from http://international.westlaw.com.
[208] *Ibid.*
[209] *Ibid.*

7 Concluding words

In the light of the aforesaid and the question specified for this work to answer, it can be concluded that an adequate and fair balance between interests of intellectual property rights bearers and those of human rights is practically possible and achievable. However, strictly complying with the letter of the international *lex lata* 'bouillon' embodied by TRIPS and UPOV, from one side and CBD, ITPGR, UDHR, and ICESCR from another, it is impossible to bring to balance any interests concerned, simply due to the contradictive law of the said agreements.

Hence, a deviation should be allowed in relation to rigidity of legal norms and insatiability of economic appetites. The question arises as to which instruments and whose appetites should suffer this deviation harmonizing its norms to adequacy with other overlapping laws; should it be intellectual property interests or human rights.

Since human rights law represents minimal and fundamental standards of the very perception of how a normal human life should be led, it deems impossible to low a level of this perception together with human rights standards. However, these standards can very successfully be ignored and regarded as moral-saving safety 'phantom' appealing to self-reconciling 'we are trying'.

Suchwise, it is advisable to assume measures to soften the intellectual property rights protection in respect to such subject matter as plant varieties for food and agriculture. Generally, to provide full flexibility for *sui generis* national protection systems (in contrast to the TRIPS requirements analyzed in 4.1), good examples of which such as African Model Law and Indian PPVFR have been discussed in Chapter six, as well as to lift some breeders' rights and limit the legal notion of a 'breeder' set by UPOV Act 1991.

Specifically, apart from those suggestions made in body text, it should be clearly affixed in law that landraces and wild species be excluded from legal protection; plant variety for food and agriculture protection rights should be exhausted after purchase and any further seed transaction permissible without further notice or qualification (mandatory to developing countries) and seed savings allowed. It is highly advisable to grant CBD, CGRFA, and human rights institutions observer status on the Council of TRIPS.

All the measures suggested in this work are not meant to hinder intellectual property rights and development in any manner but rather to bring the current *status quo* to balance, for these socio-economic transactions of creation and benefit must meet the *pro rata* basis, *i.e.* remuneration should be proportionate to the creation. The *pro rata* principle will not and cannot lead to stagnation in 'inventiveness' or willingness to

invent, for in conditions of legal monopoly which should not provide a favourable avenue for one party only the inventors will still benefit the society due to the very same stimuli – profit, adequate profit.

The closest attention is deserved by the already announced idea of establishing a special intergovernmental fund in order to subsidize perspective scientific researches in the sphere of *essential* plant resources of food and agriculture. This institution could also become a real solution for the 'creation – benefit' dilemma, as well as a partial solution hunger in the world.

In order to avoid a creation of a new 'heavy' organization, it is advisable to establish this fund within the system of United Nations Organization, which can allow reducing financial flow. The intergovernmental fund will, of course, require funding for its own needs, which should be coming from national governments. It is predictable that the funding and the distribution of financial shares among governments will become a cornerstone of the very creation and functionality of the fund. Regrettable is that humanity holistically is not interested in itself; it is only individuals who are interested in their selves.

As a matter of discussion took place above, there can be suggested an obvious conclusion here that *lex ferenda*, the law as it ought to be, providing for a balance of interests in any society, what one also calls justice, is not in fact involved in 'big' reality-framing with big economic interests and human fear to be deprived of these economic interests.

Supplement A

Comparison table of principal differences between plant variety protection under UPOV 1978 Act, UPOV 1991 Act and TRIPS-compatible patent laws[210]

Subject	Breeders' rights in UPOV 1978 Act	Breeders' rights in UPOV 1991 Act	TRIPS-compatible patent laws
Eligibility for protection	Plant varieties that are novel, distinctive, uniform and stable.	Plant varieties that are novel, distinctive, uniform and stable.	Plant varieties, plants, seeds and enabling technologies that are novel, involve an inventive step, and are capable of industrial application.
Minimum exclusive rights in propagating material	Production for purposes of commercial marketing; offering for sale; marketing; repeated use for the commercial production of another variety.	Productions of multiplication; conditioning for the purposes of propagation; offering for sale; selling or other marketing; exporting; importing or stocking for any of these purposes.	Making the patented product, using the patented process, or using, offering for sale, selling or importing for those purposes the patented product or the product obtained by the patented process.
Minimum exclusive rights in harvested material	No such obligation, except for ornamental plants used for commercial propagating purposes.	Same acts as above if harvested material obtained through unauthorized use of propagating material and if breeder had no reasonable opportunity to exercise his right in relation to the propagating material.	Making the patented product, using the patented process, or using, offering for sale, selling or importing for those purposes the patented product or the product obtained by the patented process.
Breeders' exemption	Mandatory. Breeders free to use protected variety to develop a new variety.	Permissive. But breeding and exploitation of variety "essentially derived" from an earlier variety requires the right holder's authorization.	Generally not recognized, although compatibility with TRIPS not yet tested.
Farmers' privilege	Implicitly allowed under the definition of minimum exclusive rights.	Permissive within reasonable limits and subject to safeguarding the legitimate interests of the right holder.	Generally not recognized, although compatibility with TRIPS not yet tested.
Additional exceptions to exclusive rights	None specified.	Acts done privately and for non-commercial purposes.	Research and experimentation. All exemptions must comply with three-part test of TRIPS Article 30.
Minimum term of protection	18 years fro trees and grapevines; 15 years for all other plants.	25 years for threes and grapevines; 20 years for all other plants.	20 years from date the patent application filed.

[210] Helfer, Laurence R. (2002). Intellectual Property Rights in Plant Varieties: An Overview with Options for National Governments. *FAO Legal Papers Online*, *32*, Retrieved September 26, 2007, from http://www.fao.org

Supplement B

Table of classification of states according to their international IP obligations[211]

Required IPR obligations relating to plant varieties	Member of TRIPS & UPOV 1991 Act	Member of TRIPS & UPOV 1978 Act	Member of UPOV 1978 or 1991 Act only	Member of TRIPS only	Not a member of TRIPS, UPOV or other IPR agreements
Applicable subject matter	All varieties of plants.	All varieties of plants.	Lesser number of varieties as permitted under relevant Act.	All varieties of plants.	Any number of plant varieties may be protected.
Eligibility requirements	Novelty, distinctness, uniformity and stability.	Novelty, distinctness, uniformity and stability.	Novelty, distinctness, uniformity and stability.	No mandatory requirements, but state must adopt some standard to identify eligible varieties.	No requirements for eligibility.
Protected material	Vegetative and reproductive propagating material; harvested material, under particular conditions.	Vegetative and reproductive propagating material; harvested material for commercial use of ornamentals.	Material required to be protected by relevant UPOV Act.	No material required to be protected, but state must protect sufficient material to grant breeders an IPR.	No material need be protected.
National treatment and MFN treatment	Applicable to all TRIPS members.	Applicable to all TRIPS members.	Nat'l treatment only to members of same UPOV Act; limited reciprocity under 1978 Act.	Applicable to all TRIPS members.	State may deny protection to foreign breeders or protect only some foreign breeders.
Exclusive rights granted to plant breeders	All exclusive rights listed in Article 14 of 1991 Act.	All exclusive rights listed in Article 5 of 1978 Act.	All exclusive rights listed in relevant Acts.	Not required of rights of remuneration granted.	No exclusive rights required to be granted to plant breeders.
Rights of remuneration granted to plant breeders	Not allowed as substitute for exclusive rights; allowed under compulsory licence of	Not allowed as substitute for exclusive rights; allowed under compulsory licence of	Not allowed as substitute for exclusive rights; allowed under compulsory licence rules	Nor required of exclusive rights granted.	No right of remuneration required to be granted to plant breeders.

[211] Helfer, Laurence R. (2002). Intellectual Property Rights in Plant Varieties: An Overview with Options for National Governments. *FAO Legal Papers Online*, *32*, Retrieved September 26, 2007, from http://www.fao.org

	Article 17 of 1991 Act.	Article 9 of 1978 Act.	of relevant Act.		
Term of protection	20 & 25 year terms required by Article 19 of 1991 Act.	15 & 18 year terms required by Article 8 of 1978 Act.	Terms required by relevant UPOV Act.	No particular term required.	No particular term required.
Effective enforcement measures	Required.	Required.	Not required under either UPOV Act.	Required.	No enforcement measures required.
Exceptions and limitations	None required, but permitted only under conditions stated in Article 15 of 1991 Act.	Mandatory breeders' exemption. Farmers privilege permitted but not required.	Mandatory breeders' exemption under 1978 Act only. Other exceptions as permitted by relevant Act.	None required, but permitted in any form consistent with core elements of Article 27.3(b).	None required.
Other requirements	Those imposed by 1991 Act.	Those imposed by 1978 Act.	Those imposed by relevant Act.	None.	None.

Bibliography

1. **Aoki, Keith** (March, 2007). Distributive and Syncretics Motives in Intellectual Property Law (with Special Reference to Coercion, Agency, and Development). *U.C. Davis Law Review, 40*.
2. **Aoki, Keith** (2004). Malthus, Mendel, and Monsanto: Intellectual Property and the Law and Politics of Global Food Supply: an Introduction. *Journal of Environmental Law and Litigation, 19*.
3. **Barron, Nadine** and **Ed Couzens** (2004). Intellectual Property Rights and Plant Variety Protection in South Africa: an International Perspective. *Journal of Environmental Law, 16*.
4. **Bonadio, Enrico** (2007). Crop Breeding and Intellectual Property in the Global Village. *European Intellectual Property Review, 29 (5)*.
5. **Collier, Debbie** (May 2006). Access to and Control over Plant Genetic Resources for Food and Agriculture in South and Southern Africa: How Many Wrongs before a Right? *Minnesota Journal of Law, Science & Technology, 7*.
6. **Ding, Chengfei** (Autumn 2001). The Protection of New Plant Varieties of American Business in China after China Enters WTO. *Drake Journal of Agricultural Law, 6*.
7. **Dutfield, Graham** (2002). Trade, Intellectual Property and Biogenetic Resources: A Guide to the International Regulatory Landscape. Available at International Centre for Trade and Sustainable Development (ICTSD) Web site.
8. **Dutfield, Graham** (2000). The WTO, TRIPS and the Biodiversity Convention. Available at International Institute for Sustainable Development Web site.
9. **Gervais, Daniel J.** (1999). The TRIPS Agreement: Interpretation and Implementation. *European Intellectual Property Review, 21 (3)*.
10. **Helfer, Laurence R.** (March, 2007). Toward a Human Rights Framework for Intellectual Property. *U.C. Davis Law Review, 40*.
11. **Helfer, Laurence R.** (Winter 2004). Regime Shifting: The TRIPS Agreement and New Dynamics of International Intellectual Property Lawmaking. *Yale Journal of International Law, 29*.
12. **Helfer, Laurence R.** (2003). Human Rights and Intellectual Property: Conflict or Coexistence? *Minnesota Intellectual Property Review, 5*.
13. **Helfer, Laurence R.** (2002). Intellectual Property Rights in Plant Varieties: An Overview with Options for National Governments. *FAO Legal Papers Online, 32*.
14. **Kennedy, Rónán** (Winter 2006). International Conflicts over Plant Genetic Resources: Future Developments? *Tulane Environmental Law Journal, 20*.
15. **Kongolo, Tshimanga** and **Folarin Shyllon** (2004). Panorama of the Most Controversial IP Issues in Developing Countries. *European Intellectual Property Review, 26 (6)*.

16. **Leskien, Dan** and **Michael Flitner** (1997).Intellectual Property Rights and Plant Genetic Resources: Options for a Sui Generis System. *Issues in Genetic Resources*. *6*.
17. **McManis, Charles R.** (Summer 2003). Intellectual Property, Genetic Resources and Traditional Knowledge Protection: Thinking Globally, Acting Locally. *Cardozo Journal of International and Comparative Law, 11*.
18. **Nguyen, Lory** (Autumn 2004). Vietnam's 2005 Accession Bid to the WTO: the Harmful Effects Facing Less Developed Countries. *Journal of Law & Social Challenges*, *6*.
19. **Nwabueze, Remigius N.** (Summer 2003). Ethnopharmacology, Patents and the Politics of Plants' Genetic Resources. *Cardozo Journal of International and Comparative Law, 11*.
20. **Ott, Robyn** (2004). Protection of Plant Varieties and the Farmer's Rights Act. *Oklahoma Journal of Law & Technology, 2*.
21. **Rose, Gregory** (Summer 2003). International Law of Sustainable Agriculture in the 21st Century: the International Treaty on Plant Genetic Resources for Food and Agriculture. *Georgetown International Environmental Law Review*, *15*.
22. **Ruby, Steven M.** (2004). The International Treaty on Plant Genetic Resources for Food and Agriculture: Friend of the International Farmer. *Oklahoma Journal of Law & Technology, 2*.
23. **Sell, Susan K.** (Spring, 2002). Post-TRIPS Developments: the Tension between Commercial and Social Agendas in the Context of Intellectual Property. *Florida Journal of International Law*, *14*.
24. **Smagadi, Aphrodite** (2006). Analysis of the Objectives of the Convention on Biological Diversity: Their Interrelation and Implementation Guidance for Access and Benefit Sharing. *Columbia Journal of Environmental Law*.
25. **Straub, Peter** (Winter 2006). Farmers in the IP Wrench - How Patents in Gene-Modified Crops Violate the Right to Food in Developing Countries? *Hastings International and Comparative Law Review, 29*.
26. **Tafur-Domínguez, Victor** (Autumn 2000). International Environmental Harmonization - Emergence and Development of the Andean Community. *Pace International Law Review*, *12*.
27. **Weissbrodt, David** and **Kell Schoff** (2003). Human Rights Approach to Intellectual Property Protection: the Genesis and Application of Sub-Commission Resolution 2000/7. *Minnesota Intellectual Property Review, 5*.

*** * ***

28. Access to Genetic Resources and Benefit-sharing. Bonn Guidelines. Available at Convention on Biological Diversity Web site.
29. CGRFA, Plant Genetic Resources. Available at FAO Web site.
30. Commission on Genetic Resources for Food and Agriculture. Available at FAO Web site.
31. Hunger Report 2007. Available at Bread for the World Web site.
32. IGC, Genetic Resources. Available at WIPO Web site.

33. TRIPS versus CBD: Conflicts between the WTO regime of intellectual property rights and sustainable biodiversity management. Available at GRAIN Web site.
34. TRIPS, Patents and Access to Medicines: Proposals for Clarification and Reform (Briefing Paper). Available at Third World Network Web site.
35. *Union Internationale pour la Protection des Obtentions Vegetales* (UPOV) Web site.

* * *

36. Convention on Biological Diversity.
37. General Comment No. 17 of the Committee on Economic, Social and Cultural Rights.
38. European Patent Convention.
39. International Covenant on Economic, Social and Cultural Rights.
40. International Treaty on Plant Genetic Resources for Food and Agriculture.
41. Paris Convention for the Protection of Industrial Property.
42. Press Release PR/98/143. Available at WIPO Web site.
43. Protection of Plant Varieties and Farmer's Rights Act (India).
44. Science, Technology and Research Commission of Organization of African Unity; Task Force on Community Rights and Access to Biological Resources Declaration on Community Rights and Access to Biological Resources.
45. Trade Related Aspects of Intellectual Property Rights Agreement.
46. Universal Declaration of Human Rights
47. UPOV Convention 1991/1978/1961 Acts.
48. Vienna Convention on the Law of Treaties.